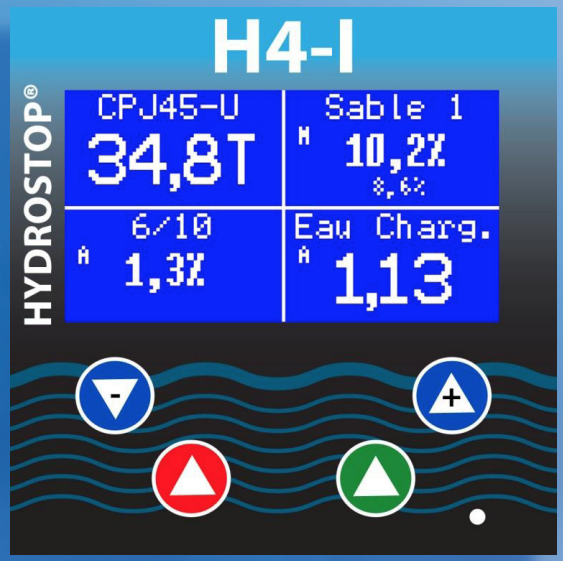
RAW MATERIALS
MANAGEMENT SYSTEM

H 4-I

USER GUIDE



Equipment :

> H4-I Display
• +Up to 1 BDH4 Deported Casing + up to 4 BDCIM Deported Casing
• +Up to 1 BDTEMP deported casing +up to 1 BDEC deported casing
• + up to 2 ITH3 casing + up to 2 HWB casing
• + up to 1 output casing HBSA
> MO2 Micro-wave probes + Supports + Cables + Chains
> Flints+ Welding stubs + Templates
> Current transformer 230Vac/24Vac

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HYDROSTOP®

H4-I-GB-0612

HYDROSTOP®

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HYDROSTOP®

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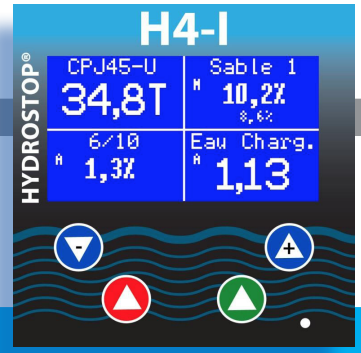


VERSION

VERSION	DATE	COMMENTS
1.0.0	03/2012	First version

1 - DESCRIPTION

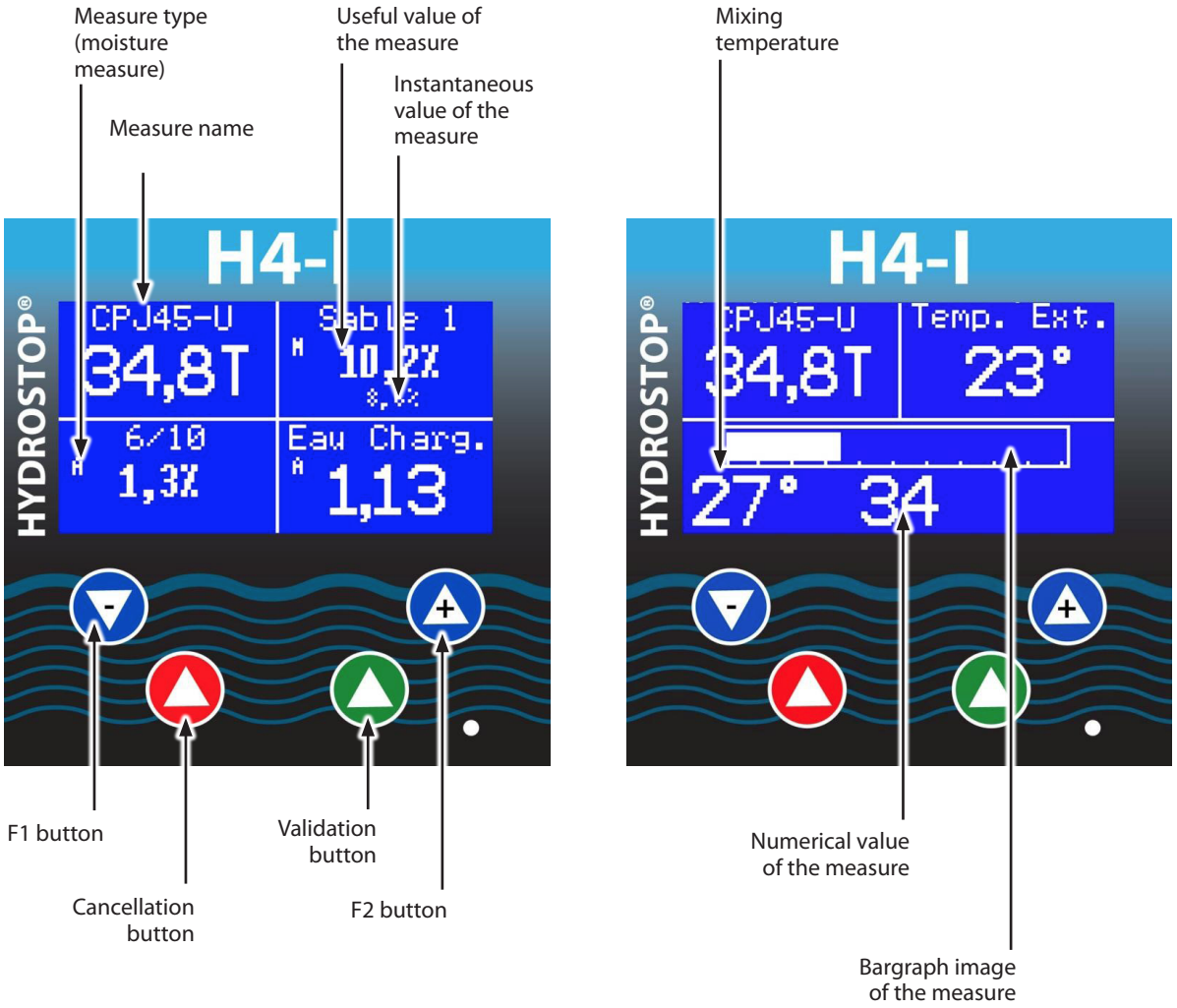
1.1. Generalities

HYDROSTOP H4-I is a device to measure useful values for the manufacturing of ready-mix concrete. H4-I allows the measurement of aggregates' moisture, as well as the weight and temperature of input and output of cement silos, the turbidity of sewage and the plasticity of the concrete into the mixer. It can display up to four of these values simultaneously.

Main features on the functionning of the H4-I

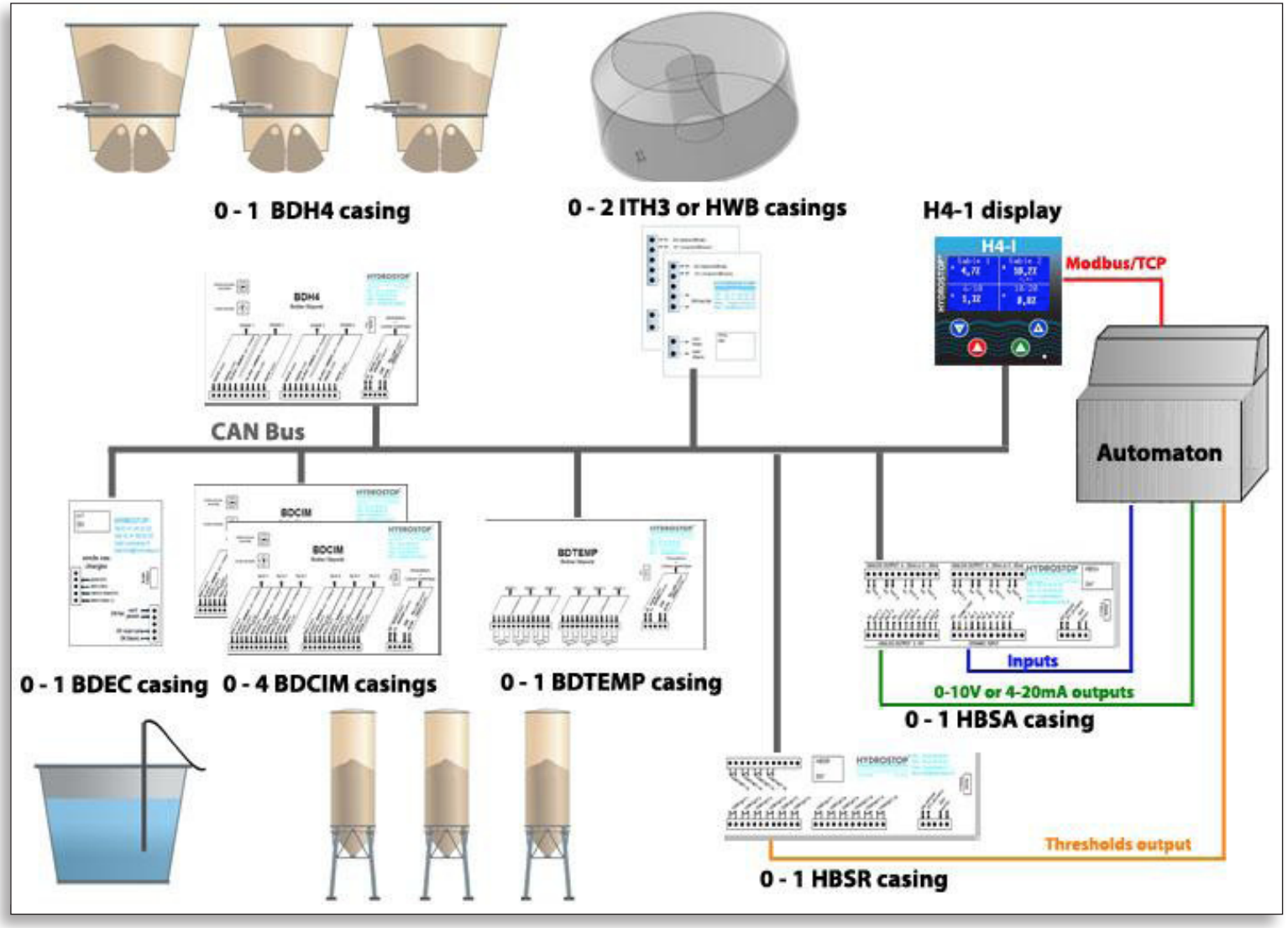
- Display of moisture from 0 to 4 aggregate bins to 0.1%
- Display of weight from 0 to 4 silos
- Display of turbidity for sewage
- Display of input and output temperature of cement silos
- Display of one or two images (plasticity of concrete in the mixer and temperature of the mixing
- Automatic configuration of the display based on the number and type of measurement displayed
- Output 0-10V, 0-20mA (optional), 4-20mA (optional) or Modbus / TCP (optional) adjustable for all values displayed
- Possibility to set moisture sensors in manual, in static or dynamic measuring mode
- Ability to set the dynamic measurement based on your system (correction, open time of bin gate).

1.2. Display description



1 - DESCRIPTION

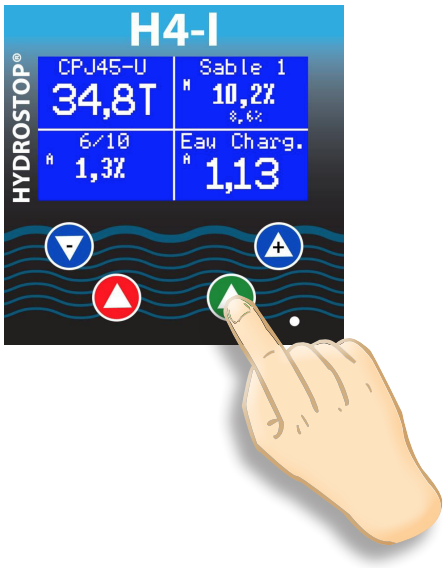
1.3. SYSTEM OVERVIEW



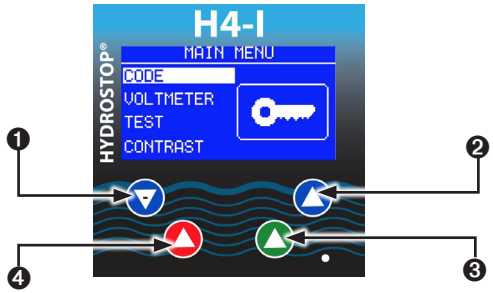
2 - SIMPLIFIED ACTIVATION

2.1. Number of probes selection

Enter the main menu of the device by pressing the "Validation" button when no box is selected.



You will then enter the following menu:



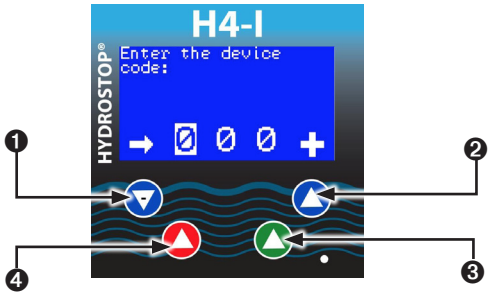
❶ Move down the menu

❷ Move up the menu.

❸ Select on option.

❹ Exit the menu and return on the main screen.

Select the "Code" option in order to enter your "administrator" code and access to all the settings of the device. This option screen will appear:



❶ Shift the selection to the right

❷ Increase the selected digit by 1

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 4 basics options.

❹ Exit to the main menu

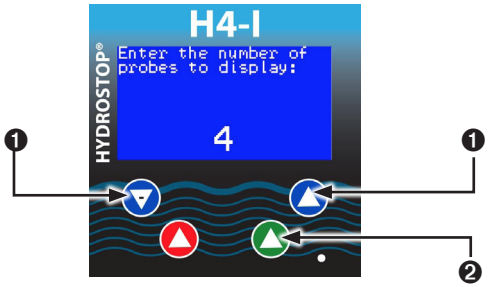
CAUTION :

The code "Administrator" at first boot is 000. We advise you to change it (see Chapter 3.1.f.)

2 - SIMPLIFIED ACTIVATION

After validating the code, the main menu will offer new options. Browse it to achieve the following option:

Press "Validation" to enter the "number of probes" selection menu. This menu appears as follows:



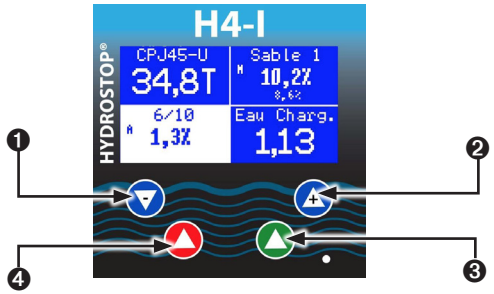
❶ Changes the value.

❷ Validation.

CAUTION: The display of a plasticity measure takes the place of two boxes. So, it limits to three the maximum number of displayed probes.

2.2. Probe type selection

Each box measure type is selected in its own menu. It can be accessed from the main screen :



❶ Select the bottom left box. If it is already selected, the left top box is selected.

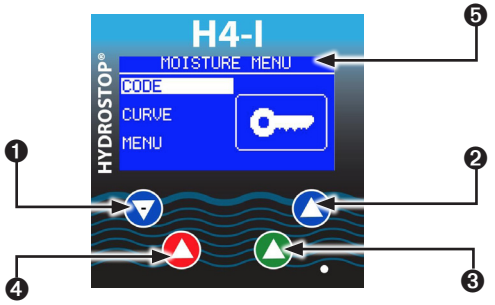
❷ Select the bottom right box. If it is already selected, the right top box is selected.

In the case of a double box , it counts as one of the two columns and so can be selected by each button.

❸ Enter the selected box menu.

❹ Cancel the current selection and thus allow the access of the main menu. If no action (new selection or entry in a menu) is performed during 5 seconds, the current selection is cancelled.

If the « administrator » code is not entered, the menu will be displayed like this:



❶ Move down the menu.

❷ Move up the menu.

❸ Select on option.

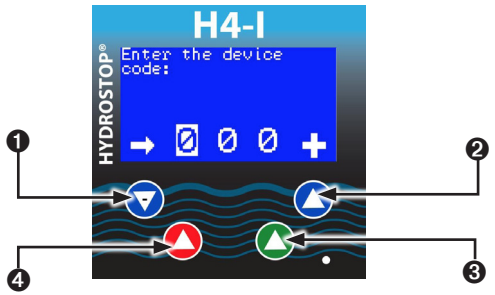
❹ Exit from the menu and return on the main screen.

❺ Name of the current menu.

Depending on the probe type, « Curve » option can be not available. Temperature and plasticity probe need no calibration, and, thus, don't offer it.

2 - SIMPLIFIED ACTIVATION

Select the « Code » option to identify you and access the advanced settings of each probe. This option screen will appear:



❶ Shift the selection to the right

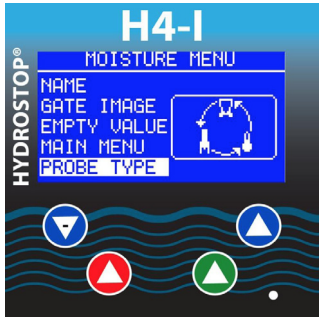
❷ Increase the selected digit by 1

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 3 basics options.

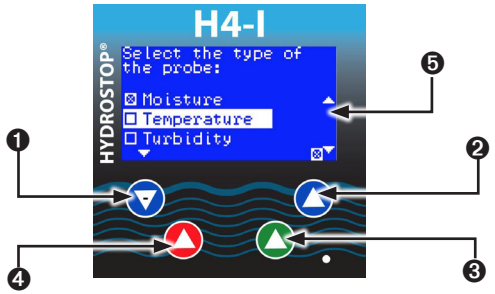
❹ Exit to the main menu

CAUTION :
The code "Administrator" at first boot is 000.
We advise you to change it (see Chapter 3.1.f.)

After validating the code, the main menu will offer new options. Browse it to achieve the following option:



The probe type menu is presented as follows:



❶ Shifts the selection

❷ Assigns the selected type to the probe

❸ Validation

❹ Exits the menu without saving changes.

❺ Indication of additional values not displayed higher or lower depending on the symbols displayed.

Depending on the number of selected boxes and types of sensors that have already been allocated, all types of measurement will not be displayed. Example: If you have three probes and a measure of plasticity has already been allocated, the "plasticity"option will no longer be offered in this menu.

Once validated, you will be redirected to the specific menu of the type of probe .

2.3. Moisture probe commissioning

2.3.a. Analog output settings

For each type of probe, an analog output (or 2 for plasticity) is automatically assigned to the HBSA. The output number is the box number.

The top left box corresponds to the output 1.

The top right box corresponds to the output 2.

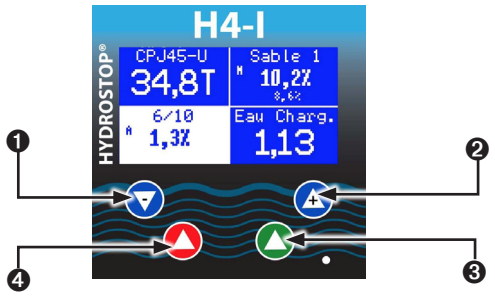
The bottom left box corresponds to the output 3.

The bottom right box corresponds to the output 4.

CAUTION: A plasticity probe requires 2 analog outputs (plasticity + temperature) that are assigned in sequence. This can cause a shift of output numbers compared to box numbers. It is therefore recommended to assign the last boxes to plasticity probes.

2 - SIMPLIFIED ACTIVATION

In order to modify the analog output resolution, you must go into your moisture probe specific menu from the main screen:



❶ Select the bottom left box. If it is already selected, the left top box is selected.

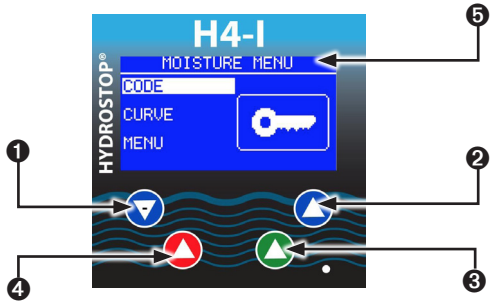
❷ Select the bottom right box. If it is already selected, the right top box is selected.

In the case of a double box, it counts as one of the two columns and so can be selected by each button.

❸ Enter the selected box menu

❹ Cancel the current selection and thus allow the access of the main menu. If no action (new selection or entry in a menu) is performed for 5 seconds, the current selection is cancelled.

If the « administrator » code is not entered, the menu will be displayed like this:



❶ Move down the menu.

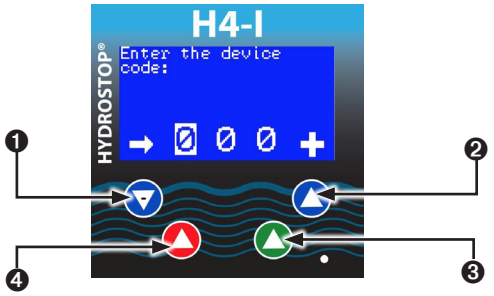
❷ Move up the menu.

❸ Select on option.

❹ Exit the menu and return on the main screen.

❺ Name of the current menu.

Select the « Code » option to identify you and access to the advanced settings of each probe. This option screen will appear:



❶ LShift the selection to the right.

❷ Increase the selected digit by 1.

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 3 basics options.

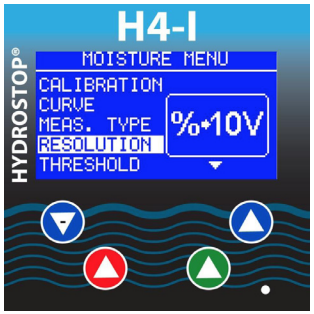
❹ Exit to the main menu.

CAUTION:

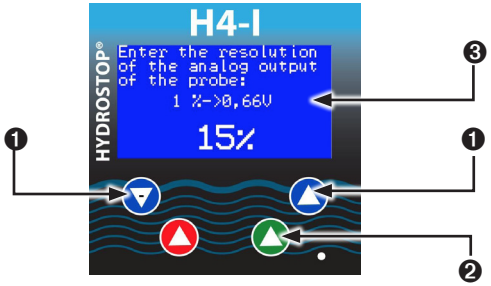
The code "Administrator" at first boot is 000.
We advise you to change it (see Chapter 3.1.f.)

2 - SIMPLIFIED ACTIVATION

After validating the code, the main menu will offer new options. Browse it to achieve the following option:



The setting is displayed in the following form:



❶ Change the value.

❷ Validation.

❸ Moisture-Voltage correspondence for the current value.

2.3.b. Moisture probe calibration

No calibration is to be done at the settings of the probe.

The measure linearization is automatically done, so for each channel, the user must act on the inner curve of the H4-I, so as to obtain the correspondence between the measure done by the microwave probe and the display of the moisture value in %.

This inner curve is a straight line and its equation has the form: y=a.x+b

y is the moisture value in %

x is the linearized voltage from the probe

To calibrate, you must enter calibration points in the H4-I (read value and real value) and the system will calculate automatically the equation of the internal curve, from the 10 last points entered.

In theory, two calibration points are enough.

To be more accurate, these two points must be the furthest possible.

To create a new calibration point

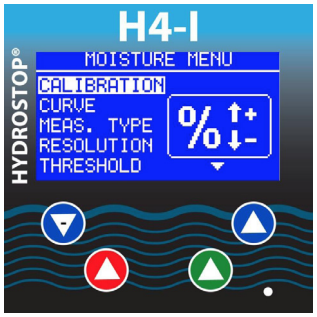
When you receive your H4-I system, the inner equation is for each channel: **y=2.6x-1.5**

If this equation does not correspond to your sand, here is the following method to make a first calibration.

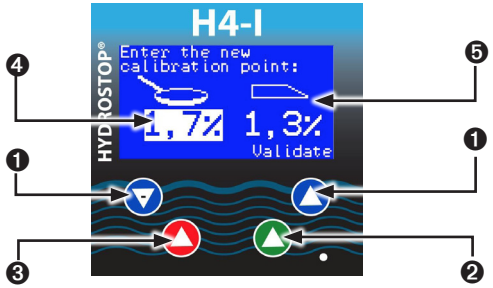
Determine in laboratory the water content of the aggregate concerned. Use the following formula :

Value in % = (Wet weight – dry weight) / dry weight

In the probe menu, select the following option :



The screen will change as follows:



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", the new point is validated and the curve is recalculated.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

2 - SIMPLIFIED ACTIVATION

❹ Moisture value of the sample found in the laboratory.
❺ Moisture value returned by the probe at the time of sampling.

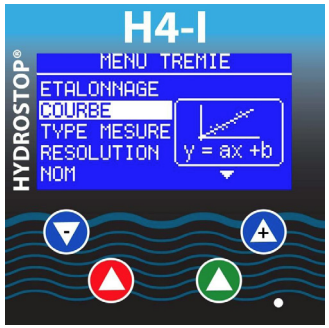
A validation screen will appear for you to confirm the creation of the new point.
Confirm to create a new point.

IMPORTANT :
The calibration has been carried out using one moisture value. To be accurate, it is imperative to perform a second calibration value with a different moisture.

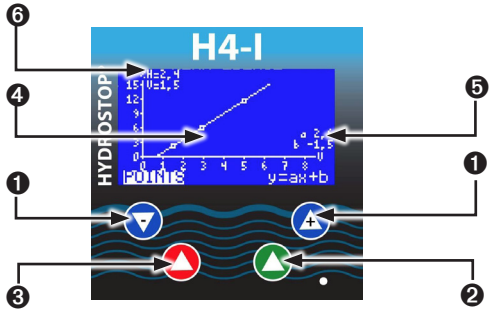
IMPORTANT :
To save your calibration values in case of problems on the display, we advise to fill out the calibration of the system located in "Appendix E - Calibration Manual" at the end of this guide.

Changing the calibration curve

If you enter wrong points, it is possible to remove them in the "Calibration curve" menu. This menu is accessible after the validation of a new point or by selecting the following option:

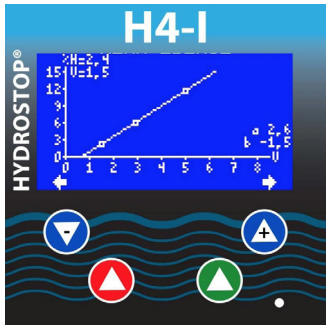


This menu appears as follows:



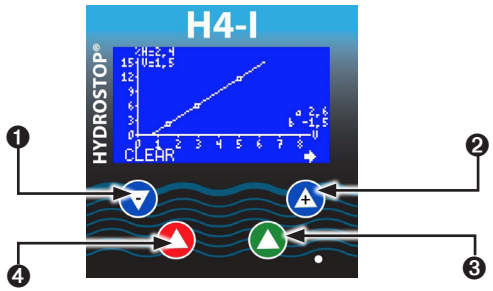
❶ Shifts the selection.
❷ Enter in a secondary menu : points management or curve equation modification.
❸ Exit the menu. Every changes will be saved.
❹ Graphical representation of the curve.
❺ Coefficients of the curve.
❻ Points coordinates (Flashing one).

If the device code is not entered, this menu will only be indicative and it will only be possible to see the coordinates of each point by scrolling through F1 and F2:



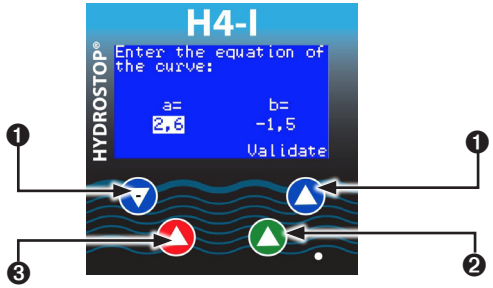
2 - SIMPLIFIED ACTIVATION

To remove wrong calibration points, select "POINTS" and you will reach the screen below.
The menu appears as follows:



❶ Delete the current point (flashing one).
❷ Select the next point.
❸ Validate changes and exit menu.
❹ Exit the menu without saving changes.

If you want to directly enter the coefficients of your curve, you must select the "y = ax+ b" in the "Curve" menu. You will then enter the following menu:



❶ Shift the selection or modify a value if it is in « active » mode.
❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", a confirmation will be required before your new equation will be considered.
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

IMPORTANT :
The modification of the curve equation will delete all previously entered calibration points.

2.4. Silo weighing probe commissioning

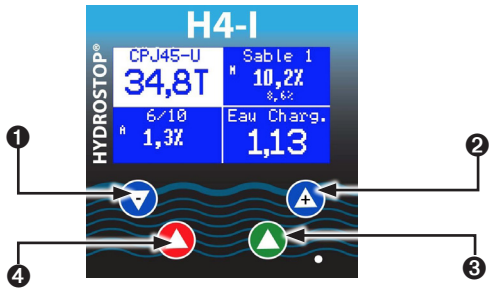
2.4.a. Analog output settings

For each type of probe, an analog output (or 2 for plasticity) is automatically assigned to the HBSA. The output number is the box number.
The top left box corresponds to the output 1.
The top right box corresponds to the output 2.
The bottom left box corresponds to the output 3.
The bottom right box corresponds to the output 4.

CAUTION:
A plasticity probe requires 2 analog outputs (plasticity + temperature) that are assigned in sequence. This can cause a shift of output numbers compared to box numbers. It is therefore recommended to assign the last boxes to plasticity probes.

2 - SIMPLIFIED ACTIVATION

In order to modify the analog output resolution, you must go into your silo weighing probe specific menu from the main screen:



❶ Select the bottom left box. If it is already selected, the left top box is selected.

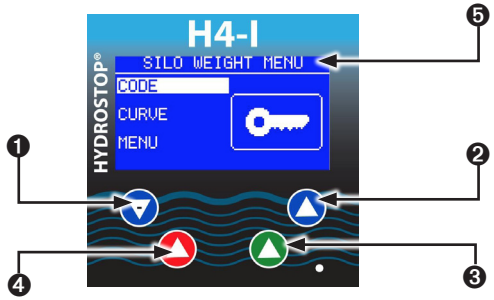
❷ Select the bottom right box. If it is already selected, the right top box is selected.

In the case of a double box, it counts as one of the two columns and so can be selected by each button.

❸ Enter the selected box menu.

❹ Cancel the current selection and thus allow the access of the main menu. If no action (new selection or entry in a menu) is performed for 5 seconds, the current selection is cancelled.

If the « administrator » code is not entered, the menu will be displayed like this:



❶ Move down the menu.

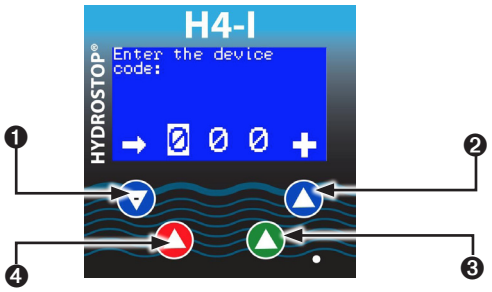
❷ Move up the menu.

❸ Select on option.

❹ Exit the menu and return on the main screen.

❺ Name of the current menu.

Select the « Code » option to identify you and access to the advanced settings of each probe. This option screen will appear:



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 3 basics options.

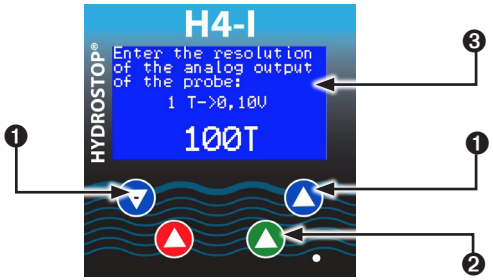
❹ Exit to the main menu.

CAUTION:
The code "Administrator" at first boot is 000.
We advise you to change it (see Chapter 3.1.f.)

2 - SIMPLIFIED ACTIVATION

After validating the code, the main menu will offer new options. Browse it to achieve the following option:

The setting is displayed in the following form:



❶ Changes the value.

❷ Validation.

❸ Weight-Voltage correspondence for the current value.

IMPORTANT :

For the measurement to be as accurate as possible, we advise you to install and calibrate the flint when the silo is empty. If the calibration is done while the silo is not empty, we do not guarantee accuracy. To ensure optimum operation, you must carefully follow the installation recommendations of the flint in the "Installation" part of this guide (Appendix D).

2.4.b. Silo weighing probe calibration

No calibration is to be done at the settings of the probe.

The measure linearization is automatically done, so for each channel, the user must act on the inner curve of the H4-I, so as to obtain the correspondence between the measure done by the Flint probes and the display of the silo weight value in tons.

This inner curve is a straight line and its equation has the form: y=a.x+b

y is the weight value in tons

x is the linearized voltage from the probe

To calibrate, you must enter calibration points in the H4-I (read value and real value) and the system will calculate automatically the equation of the internal curve, from the 10 last points entered.

In theory, two calibration points are enough.

To be more accurate, these two points must be the furthest possible.

Create a new calibration point

When you receive your H4-I system, the inner equation is for each channel: y=75.0x-225.0

If this equation does not correspond to your silo, here is the following method to make a first calibration.

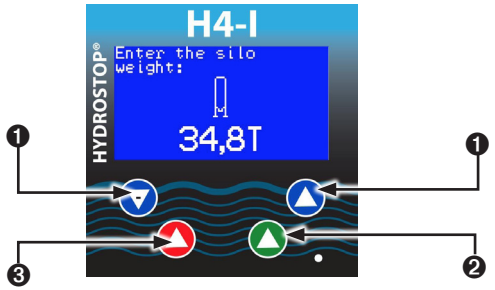
Empty your silo until the screw turns in the air.

Do not try to remove the dead stocks as they reform and lead a shift in the measurement.

In the menu of the probe select the following option:

2 - SIMPLIFIED ACTIVATION

The screen will change as follow :



❶ Change the value.

❷ Validation.

❸ Exit the menu without saving the new point.

A validation screen will appear for you to confirm the creation of the new point.

Confirm to create a new point.

IMPORTANT :

The calibration has been carried out using one weight value. To be accurate, it is imperative to perform a second calibration just after loading the silo by using the weighing value. So your two points are as closest to reality as possible.

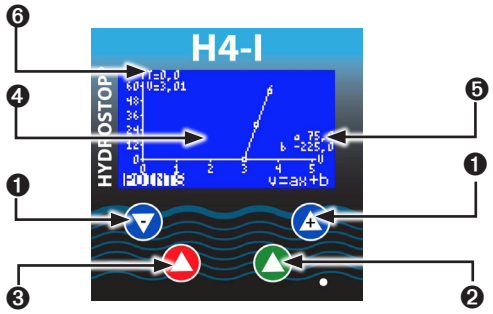
IMPORTANT :

To save your calibration values in case of problems on the display, we advise you to fill out the calibration of the system located in "Appendix E - Calibration Manual" at the end of this guide.

Modifying the calibration curve

If you enter wrong points, it is possible to remove them in the "Calibration curve" menu. This menu is accessible after the validation of a new point or by selecting the following option:

This menu appears as follows:



❶ Shift the selection.

❷ Enter in a secondary menu: Points management or Curve equation modification.

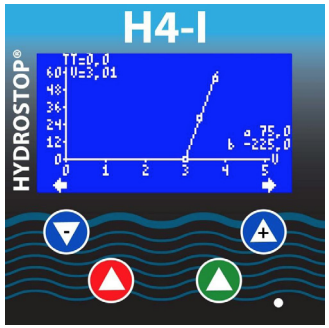
❸ Exit the menu. Every changes will be saved.

❹ Graphical representation of the curve.

❺ Coefficients of the curve.

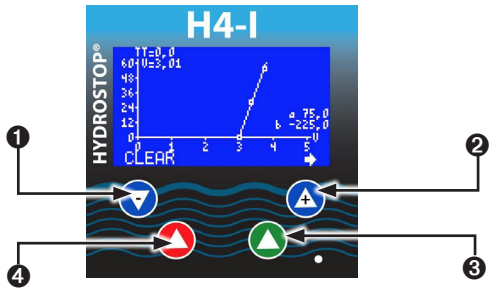
❻ Points coordinates (Flashing one).

If the device code is not entered, this menu will only be indicative and it will only be possible to see the coordinates of each point by scrolling through F1 and F2:



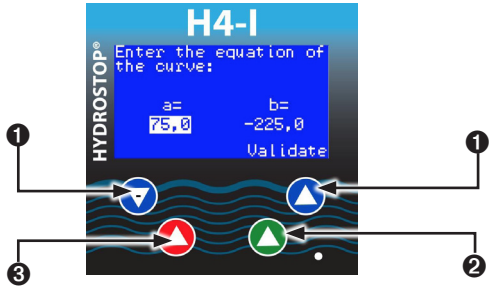
2 - SIMPLIFIED ACTIVATION

To remove wrong calibration points, select "POINTS" and you will reach the screen below.
The menu appears as follows:



❶ Delete the current point (flashing one).
❷ Select the next point.
❸ Validate changes and exits menu.
❹ Exit the menu without saving changes.

If you want to directly enter the coefficients of your curve, you must select the "y = ax+ b" in the "Curve" menu. You will then enter the following menu:



❶ Shift the selection or modify a value if it is in « active » mode.
❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", a confirmation will be required before your new equation will be considered.
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

Après avoir modifié les paramètres souhaités, validez.
Une confirmation vous sera demandée.

IMPORTANT:
The modification of the curve equation will delete all previously entered calibration points.

2.5. Temperature probe commissioning

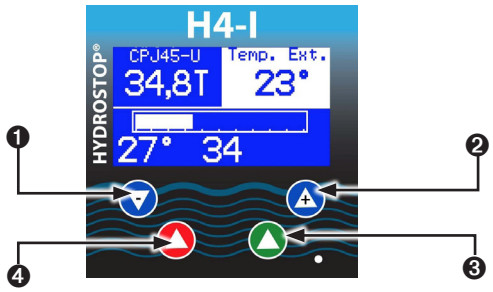
2.5.a. Analog output settings

For each type of probe, an analog output (or 2 for plasticity) is automatically assigned to the HBSA. The output number is the box number.
The top left box corresponds to the output 1.
The top right box corresponds to the output 2.
The bottom left box corresponds to the output 3.
The bottom right box corresponds to the output 4.

CAUTION:
A plasticity probe requires 2 analog outputs (plasticity + temperature) that are assigned in sequence. This can cause a shift of output numbers compared to box numbers. It is therefore recommended to assign the last boxes to plasticity probes.

2 - SIMPLIFIED ACTIVATION

In order to modify the analog output resolution, you must go into your temperature probe specific menu from the main screen:



❶ Select the bottom left box. If it is already selected, the left top box is selected.

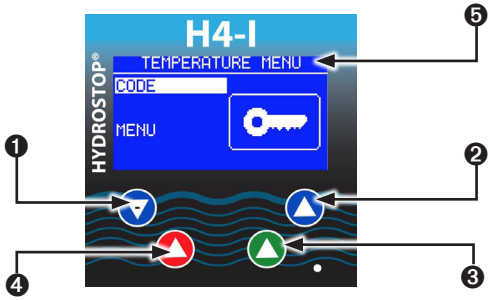
❷ Select the bottom right box. If it is already selected, the right top box is selected.

In the case of a double box, it counts as one of the two columns and so can be selected by each button.

❸ Enter the selected box menu.

❹ Cancel the current selection and thus allow the access of the main menu. If no action (new selection or entry in a menu) is performed for 5 seconds, the current selection is cancelled.

If the « Administrator » code is not entered, the menu will be displayed like this:



❶ Move down the menu.

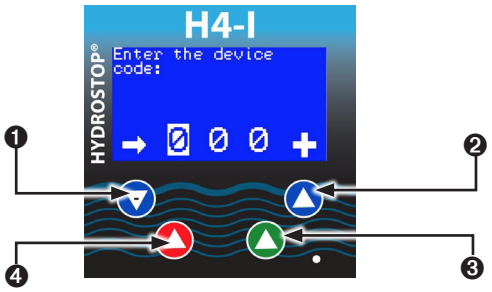
❷ Move up the menu.

❸ Select on option.

❹ Exit the menu and return on the main screen.

❺ Name of the current menu.

Select the « Code » option to identify you and access the advanced settings of each probe. This option screen will appear:



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

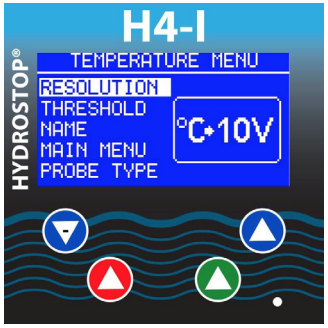
❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 2 basics options.

❹ Exit to the main menu.

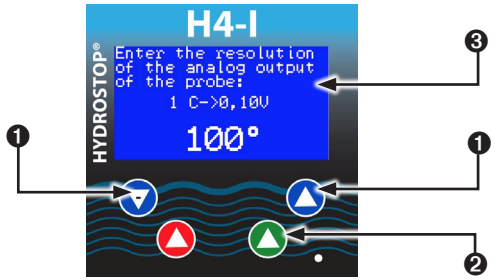
CAUTION:
The code "Administrator" at first boot is 000.
We advise you to change it (see Chapter 3.1.f.)

2 - SIMPLIFIED ACTIVATION

After validating the code, the main menu will offer new options. Browse it to achieve the following option:



The setting is displayed in the following form:



❶ Changes the value.

❷ Validation.

❸ Temperature-Voltage correspondence for the current value.

2.6. Turbidity probe commissioning

2.6.a. Analog output settings

For each type of probe, an analog output (or 2 for plasticity) is automatically assigned to the HBSA. The output number is the box number.

The top left box corresponds to the output 1.

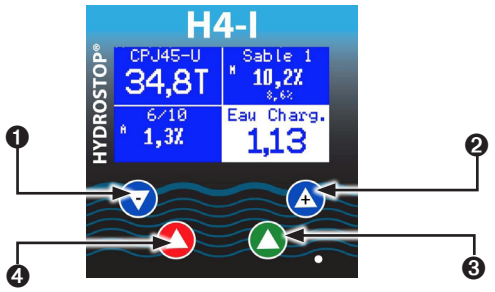
The top right box corresponds to the output 2.

The bottom left box corresponds to the output 3.

The bottom right box corresponds to the output 4.

CAUTION:
A plasticity probe requires 2 analog outputs (plasticity + temperature) that are assigned in sequence. This can cause a shift of output numbers compared to box numbers. It is therefore recommended to assign the last boxes to plasticity probes.

In order to modify the analog output resolution, you must go into your turbidity probe specific menu from the main screen:



❶ Select the bottom left box. If it is already selected, the left top box is selected.

❷ Select the bottom right box. If it is already selected, the right top box is selected.

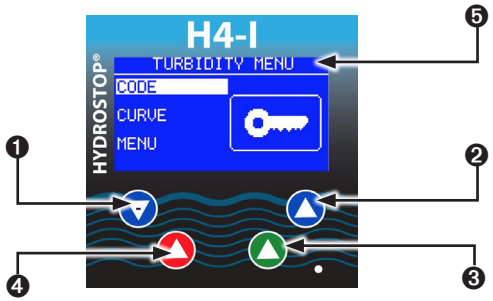
In the case of a double box, it counts as one of the two columns and so can be selected by each button.

❸ Enter the selected box menu.

❹ Cancel the current selection and thus allow the access of the main menu. If no action (new selection or entry in a menu) is performed for 5 seconds, the current selection is cancelled.

2 - SIMPLIFIED ACTIVATION

If the « administrator » code is not entered, the menu will be displayed like this:



❶ Move down the menu.

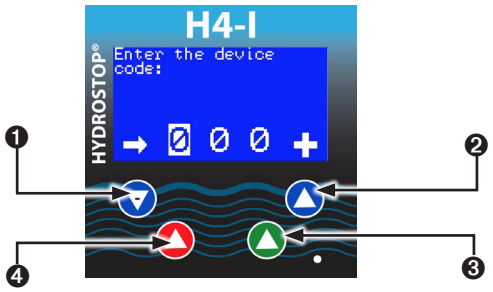
❷ Move up the menu.

❸ Select on option.

❹ Exit the menu and return on the main screen.

❺ Name of the current menu.

Select the « Code » option to identify you and access the advanced settings of each probe. This option screen will appear:



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

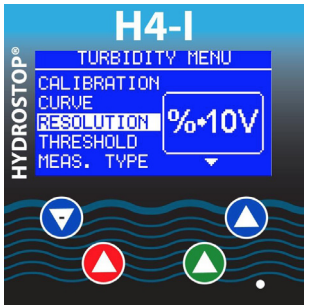
❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 3 basics options.

❹ Exit to the main menu.

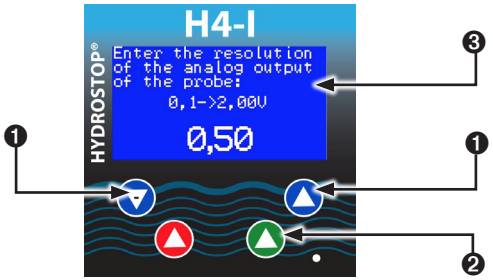
CAUTION:

The code "Administrator" at first boot is 000. We advise you to change it (see Chapter 3.1.f.)

After validating the code, the main menu will offer new options. Browse it to achieve the following option:



The setting is displayed in the following form:



❶ Change the value.

❷ Validation.

❸ Turbidity-Voltage correspondence for the current value.

CAUTION:

Turbidity cannot be less than 1.00, as the analogical output uses the value of 1.00 as a base value. Thus, if the probe is 1.26, the H4-I will send its analogical output, the base value of 0.26. This device increases the accuracy by avoiding an unnecessary value range.

2 - SIMPLIFIED ACTIVATION

2.6.b. Turbidity probe calibration

No calibration is to be done at the settings of the probe.

The measure linearization is automatically done, so for each channel, the user must act on the inner curve of the H4-I, so as to obtain the correspondence between the measure done by the probe and the display of the turbidity value

This inner curve is a straight line and its equation has the form: y=a.x+b

y is the turbidity value

x is the linearized voltage from the probe

To calibrate, you must enter calibration points in the H4-I (read value and real value) and the system will calculate automatically the equation of the internal curve, from the 10 last points entered.

In theory, two calibration points are enough.

To be more accurate, these two points must be the furthest possible.

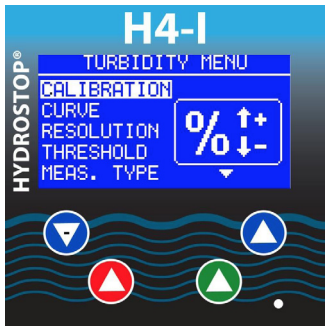
Create a new calibration point

When you receive your H4-I system, the inner equation is for each channel: y=0.2x+ 1.0

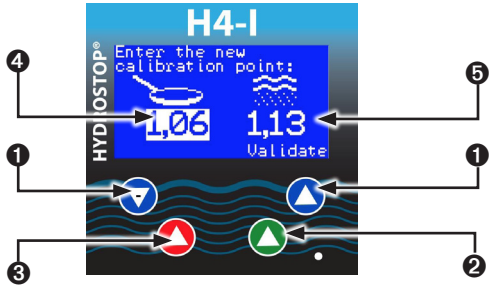
If this equation does not correspond to your sewage, here is the following to make a first calibration.

Determine in laboratory the turbidity of your sewage. To recall, the turbidity is equal to the weight of a sample of one liter of sewage.

In the probe menu, select the following option :



The screen will change as follows:



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", the new point is validated and the curve is recalculated.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

❹ Turbidity value of the sample found in the laboratory.

❺ Turbidity value returned by the probe at the time of sampling.

A validation screen will appear for you to confirm the creation of the new point.

Confirm to create a new point.

IMPORTANT :

The calibration has been carried out using one turbidity value. To be accurate, it is imperative to perform a second calibration value with a different turbidity.

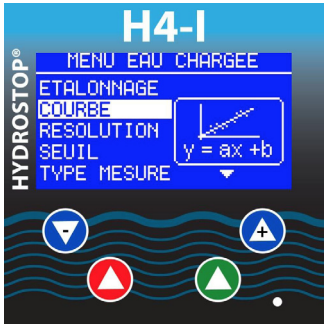
IMPORTANT :

To save your calibration values in case of problems on the display, we advise to fill out the calibration of the system located in "Appendix E - Calibration Manual" at the end of this guide.

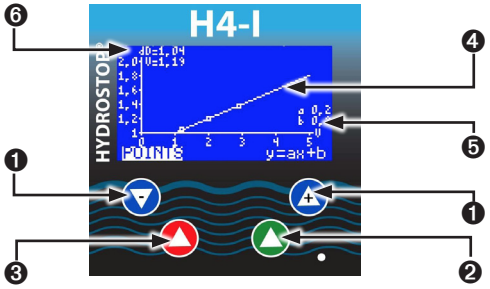
2 - SIMPLIFIED ACTIVATION

Modifying the calibration curve

If you enter wrong points, it is possible to remove them in the "Calibration curve" menu. This menu is accessible after the validation of a new point or by selecting the following option:



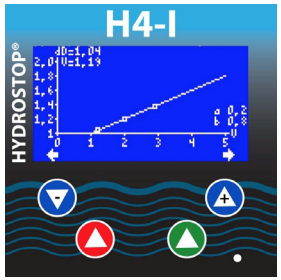
This menu appears as follows:



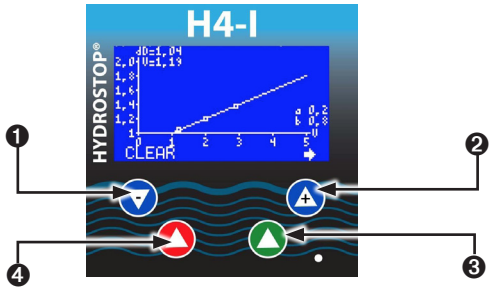
❶ Shift the selection.
❷ Enter in a secondary menu: points management or curve equation modification.
❸ Exit the menu. Every changes will be saved.
❹ Graphical representation of the curve.
❺ Coefficients of the curve.

❻ Points coordinates (Flashing one).

If the device code is not entered, this menu will only be indicative and it will only be possible to see the coordinates of each point by scrolling through F1 and F2:

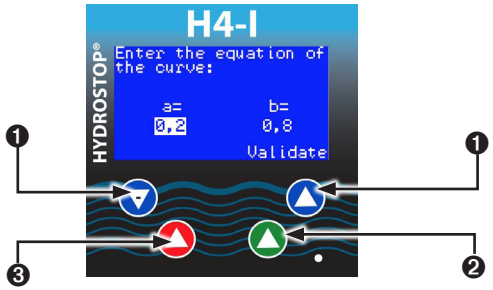


To remove wrong calibration points, select "POINTS" and you will reach the screen below.
The menu appears as follows:



❶ Delete the current point (flashing one).
❷ Select the next point.
❸ Validate changes and exits menu.
❹ Exit the menu without saving changes.

If you want to directly enter the coefficients of your curve, you must select the "y = ax+ b" in the "Curve" menu. You will then enter the following menu:



❶ Shift the selection or modify a value if it is in « active » mode.
❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", a confirmation will be required before your new equation will be considered.
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

IMPORTANT:
The modification of the curve equation will delete all previously entered calibration points.

2 - SIMPLIFIED ACTIVATION

2.7. Plasticity probe commissioning

Each plasticity probe can also measure the temperature of concrete production, either with an external sensor for wattmetric probe or integrated for a microwave probe. This temperature is optional and available on an analogical output as well as the image of plasticity.

2.7.a. Analog output settings

For each type of probe, an analog output (or 2 for plasticity) is automatically assigned to the HBSA. The output number is the box number.

The top left box corresponds to the output 1.

The top right box corresponds to the output 2.

The bottom left box corresponds to the output 3.

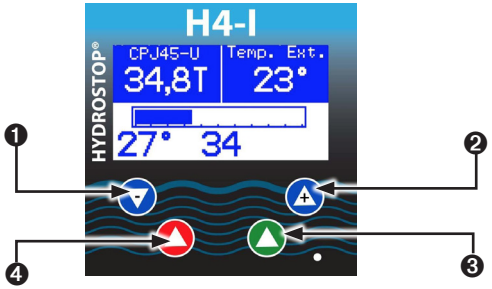
The bottom right box corresponds to the output 4.

CAUTION:

A plasticity probe requires 2 analog outputs (plasticity + temperature) that are assigned in sequence. This can cause a shift of output numbers compared to box numbers. It is therefore recommended to assign the last boxes to plasticity probes.

The resolution of the plasticity measure ranging from 0 to 100 cannot be modified in the device. The value 0 will always correspond to the minimum settings of output (0mA, 4mA or 0V) and the maximum value of 100 the maximum settings (20mA or 10V).

In order to modify the temperature analog output resolution, you must go into your plasticity probe specific menu from the main screen:



❶ Select the bottom left box. If it is already selected, the left top box is selected.

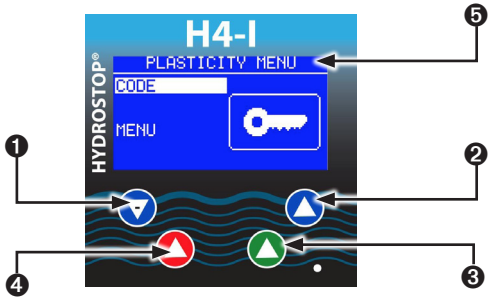
❷ Select the bottom right box. If it is already selected, the right top box is selected.

In the case of a double box, it counts as one of the two columns and so can be selected by each button.

❸ Enter the selected box menu.

❹ Cancel the current selection and thus allow the access of the main menu. If no action (new selection or entry in a menu) is performed for 5 seconds, the current selection is cancelled.

If the « administrator » code is not entered, the menu will be displayed like this:



❶ Move down the menu.

❷ Move up the menu.

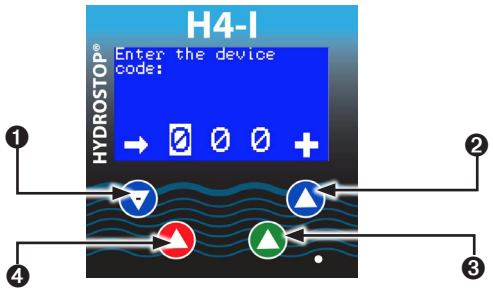
❸ Select on option.

❹ Exit the menu and return on the main screen.

❺ Name of the current menu.

2 - SIMPLIFIED ACTIVATION

Select the « Code » option to identify you and access the advanced settings of each probe. This option screen will appear:



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

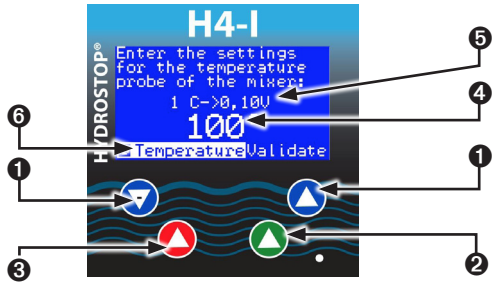
❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 3 basics options.

❹ Exit to the main menu.

CAUTION:
The code "Administrator" at first boot is 000.
We advise you to change it (see Chapter 3.1.f.)

After validating the code, the main menu will offer new options. Browse it to achieve the following option:

The setting is displayed in the following form:



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change.

If the selection is on "Temperature", the activation of temperature measure changes state. If the selection is on "validate", the changes are saved.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

❹ Maximum value written on the analog output.

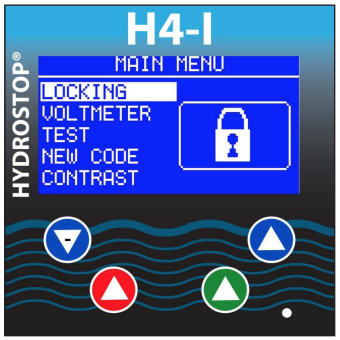
❺ Temperature-voltage correspondence for the current value.

❻ Activation of temperature.

3 - DESCRIPTION OF MENUS

3.1. Main menu

The main menu of the device allows you to configure all the specific H4-I options.



These options are:

Available without the « Administrator » code

« Administrator » code entry

« Voltmeter » option

Test Device test

Contrast

Available with the « Administrator » code

Device locking

« Administrator » code

Number of probes

IP address

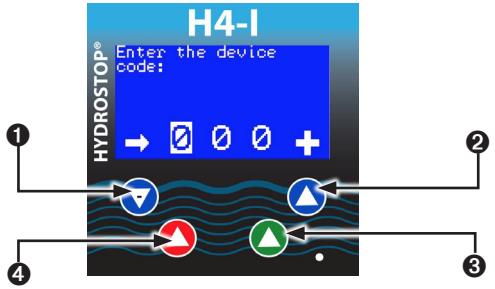
Language

3.1.a. « Administrator » code entry

Definition

The "Administrator" code, when entered, allows the user to access more settings, as the calibration of the probes. The basic code is "000". We advise you to change upon receipt of the display to limit the number of people who can change the settings (see Chapter 3.1.f.)

The "Administrator" code is a 3-digit code. When entered, it remains active for 5 minutes at the end of which it will need to be entered again in order to continue editing the advanced options of the device. This time can be shortened by using the "Locking device" option (see Chapter 3.1.e.).



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 4 basics options.

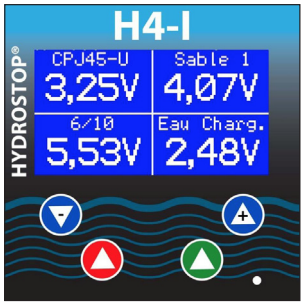
❹ Exit to the main menu.

3.1.b. « Voltmeter » option

Definition

The voltmeter option is primarily a maintenance option that allows, in case of problems on the system, to check the voltage settings of the probes. When using this option, the voltages returned by moisture, weight of cement and turbidity probes appear on the screen.

3 - DESCRIPTION OF MENUS



For moisture probes:
If no sensor is connected to an input, the voltage level of the input is then **0.05 V**.
If a sensor is connected to an input, the voltage displayed should be greater than or equal to **0.20 V**.
This value refers to a probe that is in contact with no material.
Note: If, despite these various checks on the voltage of the probe, a doubt remains on its operation, a manual test can be performed. Just put a hand on the end of the probe so that the hand completely covers its active face while touching the part of stainless steel.
The displayed value must be worth about **6 V**.

For silo weighing probes:
If no flint is connected to an input, the voltage level of the input is **2.50 V**. If some flints are connected and their voltage is below **0.50 V** or above **4.5 V**, they are faulty. Check that none of them is incurring undue. Otherwise, contact the after-sale support service.

For turbidity probes:
If no sensor is connected to an input, the voltage level of the input is then **0.05 V**.
If a sensor is connected to an input, the voltage displayed should be greater than or equal to **1.00 V**. This value refers to a probe that is in clear water or air. If a probe is connected and the voltage level is below this value, please contact the after-sale support service.

For temperature and plasticity probes:
No voltage is returned by the probe. The display of the measurement is not affected by this option.

Test 3.1.c. Device test

Definition

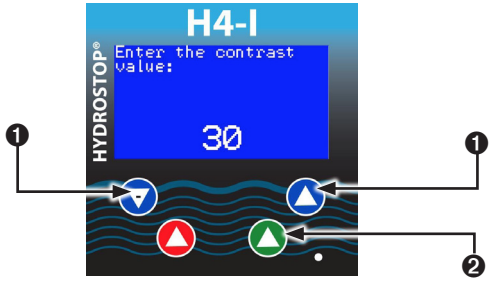
The "test device" option is used to verify the proper operation of all H4-I display + Deported casing BDH4 + Deported casing BDCIM + Deported casing BDEC. It changes the measures of the various casings and check that they remain consistent.

CAUTION: A successful device test does not mean that your probes are working perfectly. To do this, use the "voltmeter" option.

3.1.d. Contrast

Definition

Adjust the contrast of the display.



❶ Change the value.
❷ Validation.

3 - DESCRIPTION OF MENUS

3.1.e. Device locking

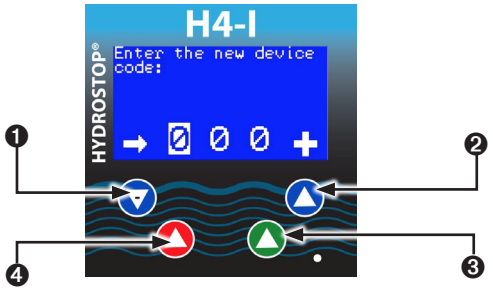
Definition

Re-enable the locking to prevent that any future changes in parameters are entered again without entry the "Administrator" code.

3.1.f. « Administrator » code

Definition

Allows you to change the « Administrator » code.



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

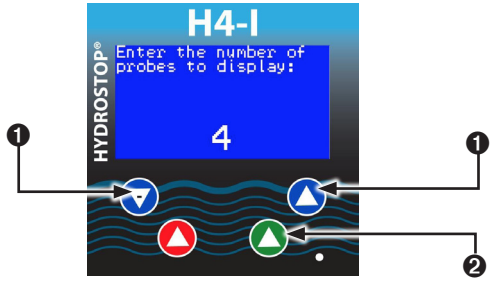
❸ Validation.

❹ Exit to the main menu.

3.1.g. Number of probes

Definition

Configures the number of probes displayed on the main screen.



❶ Changes the value.

❷ Validation.

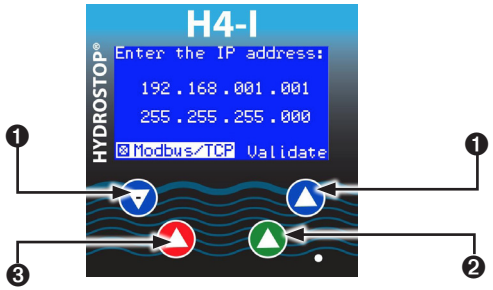
CAUTION:
The display of a measure of plasticity takes the place of two boxes. So, it limits to three the maximum number of displayed probes.

3.1.h. IP Address

Definition

Enables or disables the Modbus / TCP on the H4-1. Also allows the setup of the IP address and the subnet mask of the display.

Caution: This option is only available through order. If that was not specified, the RJ-45 connector will not be present and enabling this option will prevent the proper functionning of the analogical output.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Modbus/TCP", the activation of Modbus/TCP measure changes state. If the selection is on "validate", the changes are saved.

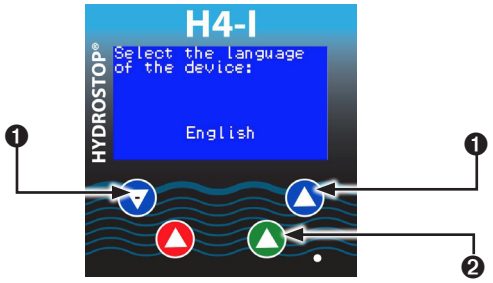
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3 - DESCRIPTION OF MENUS

3.1.i. Language

Definition

Select the language of the device.

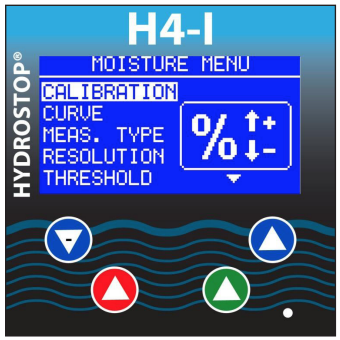


❶ Change the language.

❷ Validation.

3.2. Moisture probes advanced setup menu

The advanced setup menu can set specific options to each probe. It does not offer the same options as the type of measurement assigned to the probe. (see part 3.2.5.).



These options are:

Available without the « Administrator » code

« Administrator » code entry

Calibration curve

Main menu

Available with the « Administrator » code

Calibration

Measurement type

Analog output settings

Threshold settings

Aggregate name

Bin gate Image type

Empty bin detection

Type of probe

Available as "Manual measurement"

Manual value

Available as "Dynamic measurement"

Dynamic measurement coefficient

Bin gate opening time

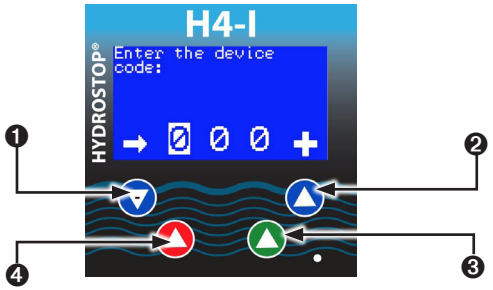
3 - DESCRIPTION OF MENUS

3.2.a. « Administrator » code entry

Definition

The "Administrator" code, when entered, allows the user to access more settings, as the calibration of the probes. The basic code is "000". We advise you to change upon receipt of the display to limit the number of people who can change the settings (see Chapter 3.1.f.)

The "Administrator" code is a 3-digit code. When entered, it remains active for 5 minutes at the end of which it will need to be entered again in order to continue editing the advanced options of the device. This time can be shortened by using the "Locking device" option (see Chapter 3.1.e.).



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

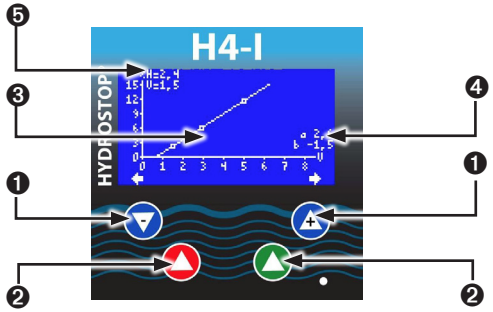
❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 4 basics options.

❹ Exit to the main menu.

3.2.b. Calibration curve

Definition

Display the equation of the calibration curve, the graph and the coordinates of all calibration points to assess their consistency.



❶ Shift the selection. The selected point is the flashing one.

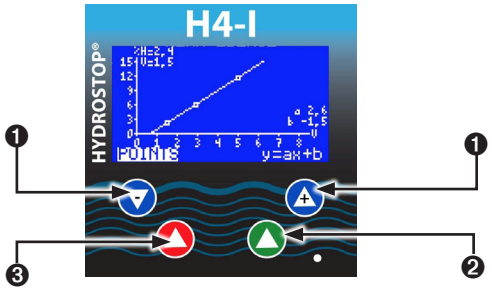
❷ Exit the menu.

❸ Graphical representation of the curve.

❹ Coefficients of the curve.

❺ Points coordinates (Flashing one).

If the « Administrator » code is entered, this menu will offer more options:



❶ Shift the selection.

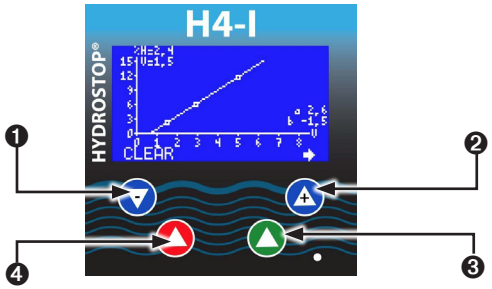
❷ Enter in a secondary menu: Points management or Curve equation modification.

❸ Exit the menu. Every changes will be saved.

3 - DESCRIPTION OF MENUS

Points control

The « Points control» allows you to delete one or more calibration points in case of wrong calibration. To have access to it, simply select "Points" in the "Curve" menu:



❶ Delete the current point (flashing one).

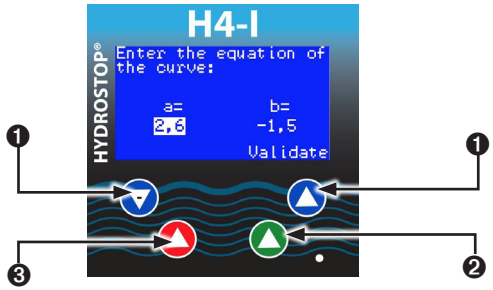
❷ Select the next point.

❸ Validate changes and exit menu.

❹ Exit the menu without saving changes.

Curve equation modification

If you want to directly enter the coefficients of your curve, you must select the "y = ax+ b" in the "Curve" menu. You will then enter into the following menu:



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", a confirmation will be required before your new equation will be considered.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

Après avoir modifier les paramètres souhaités, validez. Une confirmation vous sera demandée.

IMPORTANT:
The modification of the curve equation will delete all previously entered calibration points.

MENU **3.2.c. Main menu**

Definition

Provides access to the main menu of H4-I. If the « Administrator » code is not entered, this menu will not offer all its options.

3 - DESCRIPTION OF MENUS

3.2.d. Calibration

Definition

Add a new calibration point to the probe.

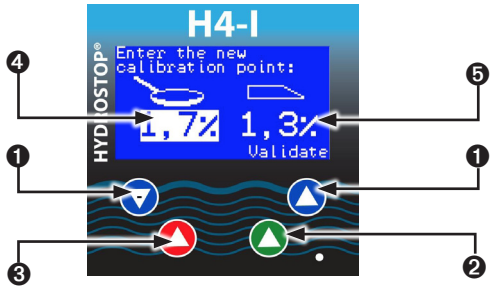
To calibrate, you must enter calibration points in the H4-I (read value and real value) and the system will calculate automatically the equation of the internal curve, from the 10 last points entered. In theory, two calibration points are enough. To be more accurate, these two points must be the furthest possible.

When you receive your H4-I system, the inner equation is for each channel: **y=2.6x-1.5**

If this equation does not correspond to your sand, where the calibration is as follows:

Determine in laboratory the water content of the aggregate concerned. Use the following formula :

Value in % = (Wet weight – dry weight) / dry weight



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", the new point is validated and the curve is recalculated.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

❹ Moisture value of the sample found in the laboratory.

❺ Moisture value returned by the probe at the time of sampling.

A validation screen will appear for you to confirm the creation of the new point.

Confirm to create a new point.

IMPORTANT:

The calibration has been carried out using one moisture value. To be accurate, it is imperative to perform a second calibration value with a different moisture.

IMPORTANT:

To save your calibration values in case of problems on the display, we advise to fill out the calibration of the system located in "Appendix E - Calibration Manual" at the end of this guide.

After confirming the creation of a new calibration point, you will be redirected to the « Curve » menu which has been updated.

3 - DESCRIPTION OF MENUS

3.2.e. Measurement type

Definition

Set the measurment type of the probe:

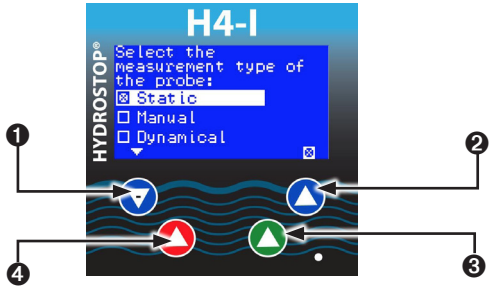
-**Static** : The H4-I displays the instantaneous value measured by the probe and provides it to the analog outputs.

- **Dynamic** : The H4-I performs 20 measurements per second, and displays on the screen the average of measurements taken since the beginning of the weighing. The moisture taken into account by the automaton for weighing is the average moisture of the previous weighing. The displayed value and the analog outputs are updated every second. When the gate closes, the average value is kept on the screen as well as on the analog output. During the opening of the gate, the density of the aggregate changes and it may be necessary to add a coefficient to the measured value. It is possible to program a different coefficient for each channel (see Section 3.2.m.).

- **Manual** : the H4-I gives a fixed value on the display and provides it on the analog output.

If a probe is configured on dynamic or manual measurement, it continues to display the instantaneous measurement made by the probe under the primary value.

Changing the type of measurement changes the options in the setup menu of moisture sensor to allow the setting of options specific to each mode of operation.



❶ Shift the selection.

❷ Assign the selected measurement type to the probe.

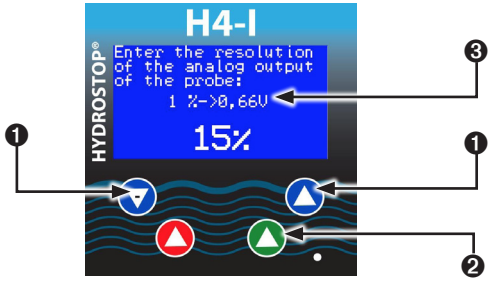
❸ Validate changes and exit menu.

❹ Exit the menu without saving changes.

3.2.f. Analog output settings

Definition

Set the maximum value returned by the analog output:



❶ Change the value.

❷ Validation.

❸ Moisture-Voltage correspondence for the current value.

3 - DESCRIPTION OF MENUS

3.2.g. Threshold settings

Definition

For each type of probe, a threshold (or 2 for the plasticity and silo weight) is configurable on the HBSR. Each box has 2 outputs allocated and will use the first as priority.

The top left box corresponds to the outputs 1 and 2.

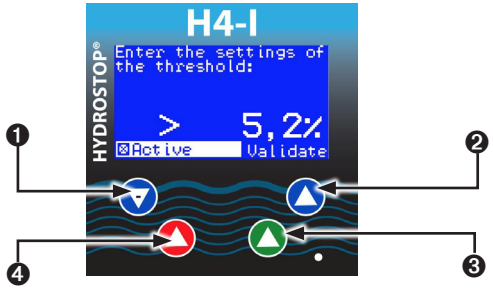
The top left box corresponds to the outputs 3 and 4.

The top left box corresponds to the outputs 5 and 6.

The top left box corresponds to the outputs 7 and 8.

Example: If the moisture is set on the box 2, the threshold will be activated on the output N° 5 of the HBSR and will correspond to the bit N° 4 of the word N°2 on the Modbus/TCP.

A threshold can be configured to be activated when the measurement is above or below a set value.



❶ Shift the selection or modify a value if it is in « active » mode.

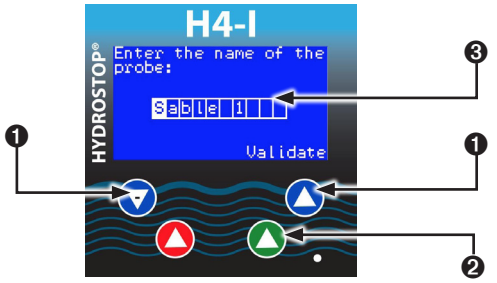
❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on the sign, it allows you to set the activation threshold when the measurement is above or below the value. If the selection is on "Confirm", the threshold is set.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3.2.h. Aggregate name

Definition

Set the name of the aggregate.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on "Confirm", the name is validated.

❸ If a value is set on « active » mode, this mode is exited and the character returns to its initial state. Otherwise, it exits the menu without saving changes.

3 - DESCRIPTION OF MENUS

3.2.i. Bin gate Image type

Definition

Allows to set whether the relay image of the bin gate is normally open (NO) or Normally Closed (NC). The activation of this relay is required for the dynamic measurement mode and allows to track the opening of the bin on the screen. The relay is connected to the inputs of the dynamic HBSA. Each entry corresponds to the box with the same number.

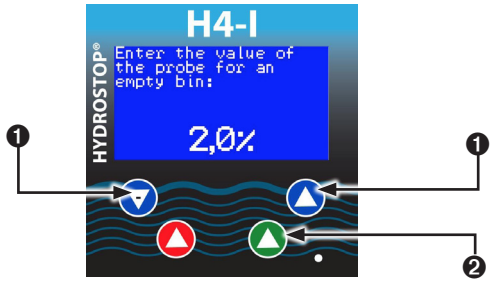
CAUTION

As with analogical outputs, plasticity measurements occupy two seats for dynamic entries. The correlation between dynamics inputs and the box number is not ensured. Therefore we advise to place the plasticity in the last box.

3.2.j. Empty bin detection

Definition

Sets the moisture threshold from which one considered the bin empty. From this settings on, the probe will be in default mode "empty bin" and indicates it on the main screen.



❶ Change the value.

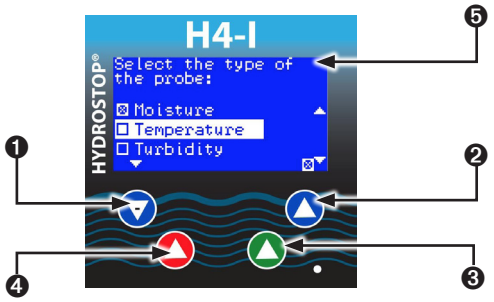
❷ Validation.

3.2.k. Type of probe

Definition

The H4-I is fully configurable for the type of probe displayed. It is therefore possible to assign to each box a sensor type according to the deported casings on the CAN bus. The various measurements available are: Moisture, silo weight, temperature, turbidity and concrete plasticity. This last one indicates also the temperature of the mixing and requires 2 boxes to be displayed fully, thus limiting their number.

To assign a probe, just select the measurement on the screen, press the button assignment, and then validate.



❶ Shift the selection.

❷ Assign the selected type to the probe.

❸ Validation.

❹ Exit the menu without saving changes.

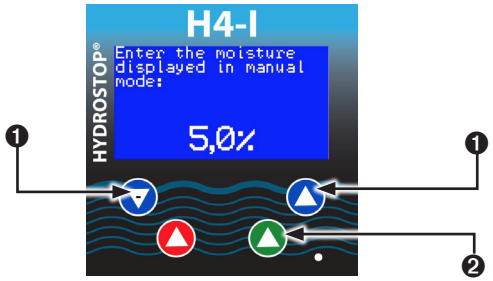
❺ Indication of additional values not displayed higher or lower depending on the symbols displayed.

3 - DESCRIPTION OF MENUS

3.2.l. Manual value

Definition

Set the value assigned to the probe when it is in manual mode.



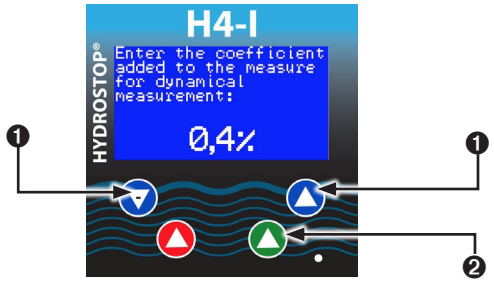
❶ Change the value.

❷ Validation.

3.2.m. Dynamic measurement coefficient

Deinition

During the opening of the bin gate, the density of the aggregate changes and it may be necessary to add a coefficient to the measured value. This coefficient may be different for each channel.



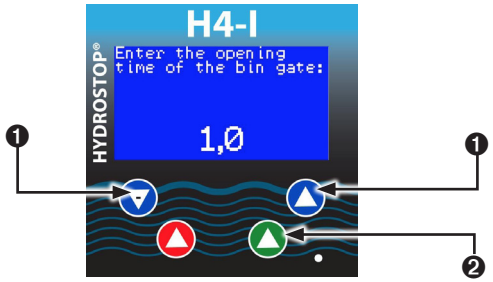
❶ Change the value.

❷ Validation.

3.2.n. Bin gate opening time

Definition

Sets the time it takes for the gate to be opened to begin dynamic measurement only after this time.



❶ Change the value.

❷ Validation.

3 - DESCRIPTION OF MENUS

3.3. Silo weighing probe advanced setup menu

The advanced setup menu can set specific options to each probe.

These options are:

Available without the « Administrator » code

« Administrator » code entry

Calibration curve

Main menu

Available with the « Administrator » code

Calibration

Silo maximum capacity

Analog output settings

Threshold 1 settings

Threshold 2 settings

Silo name

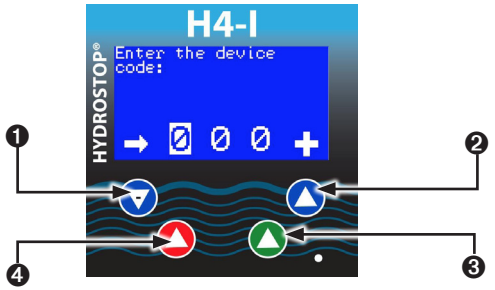
Type of probe

3.3.a. « Administrator » code entry

Definition

The "Administrator" code, when entered, allows the user to access to more settings, than the calibration of the probes. The basic code is "000". We advise you to change upon receipt of the display to limit the number of people who can change the settings (see Chapter 3.1.f.).

The "Administrator" code is a 3-digit code. When entered, it remains active for 5 minutes at the end of which it will need to be entered again in order to continue editing the advanced options of the device. This time can be shortened by using the"Locking device" option (see Chapter 3.1.e.).



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 3 basics options.

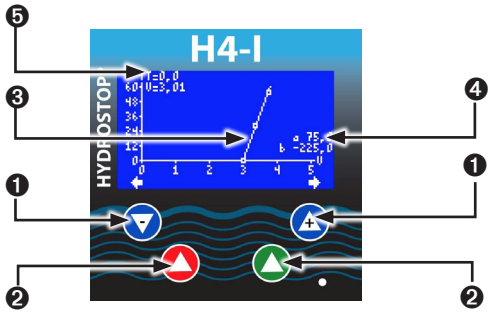
❹ Exit to the main menu.

3 - DESCRIPTION OF MENUS

3.3.b. Calibration curve

Definition

Display the equation of the calibration curve, the graph and the coordinates of all calibration points to assess their consistency.



❶ Shift the selection. The selected point is the flashing one.

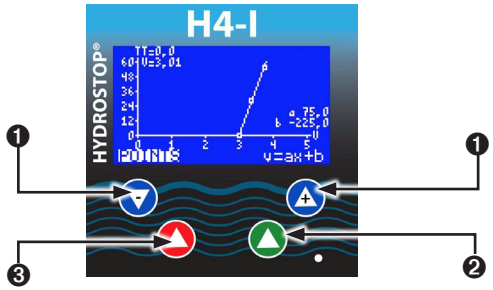
❷ Exit the menu.

❸ Graphical representation of the curve.

❹ Coefficients of the curve.

❺ Points coordinates (Flashing one).

If the « Administrator » code is entered, this menu will offer more options:



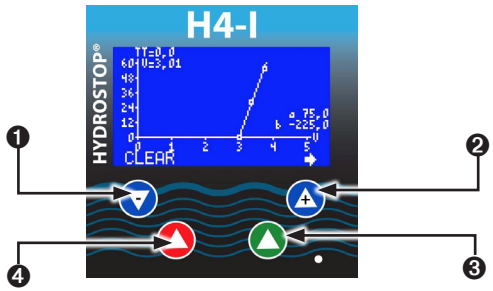
❶ Shift the selection.

❷ Enter in a secondary menu: Points management or Curve equation modification.

❸ Exit the menu. Every change will be saved.

Points control

The « points control » allows you to delete one or more calibration points in case of wrong calibration. To have access to it, simply select "Points" in the "Curve" menu:



❶ Delete the current point (flashing one).

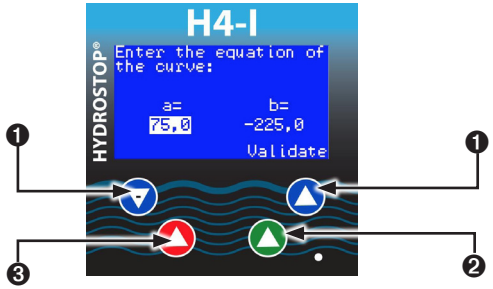
❷ Select the next point.

❸ Validate changes and exits menu.

❹ Exit the menu without saving changes.

Curve equation modification:

If you want to directly enter the coefficients of your curve, you must select the "y = ax+ b" in the "Curve" menu. You will then enter in the following menu:



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", a confirmation will be required before your new equation will be considered.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3 - DESCRIPTION OF MENUS

IMPORTANT:
The modification of the curve equation will delete all previously entered calibration points.

3.3.c. Main menu

Definition

Provides access to the main menu of H4-I. If the « Administrator » code is not entered, this menu will not offer all its options.

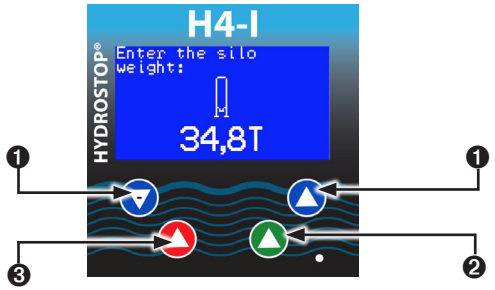
3.3.d. Calibration

Definition

Add a new calibration point to the probe.
To calibrate, you must enter calibration points in the H4-I (read value and real value) and the system will calculate automatically the equation of the internal curve, from the 10 last points entered. In theory, two calibration points are enough. To be more accurate, these two points must be the furthest possible.

When you receive your H4-I system, the inner equation is for each channel: **y=75.0x-225.0**

If this equation does not correspond to your silo, where the calibration is as follows:
Empty your silo until the screw turns in the air.
Do not try to remove the dead stocks because they will be reformed and will lead to a shift in the measurement.



❶ Change the value.
❷ Validation.
❸ Exit the menu without saving the new point.

A validation screen will appear for you to confirm the creation of the new point.
Confirm to create a new point.

IMPORTANT:
The calibration has been carried out using one weight value. To be accurate, it is imperative to perform a second calibration just after loading the silo by using the weighing value. So your two points are as closest to reality as possible.

IMPORTANT:
To save your calibration values in case of problems on the display, we advise you to fill out the calibration of the system located in "Appendix E - Calibration Manual" at the end of this guide.

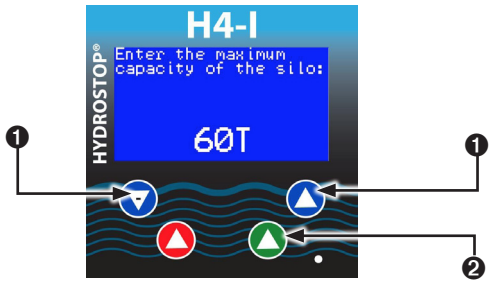
After confirming the creation of a new calibration point, you will be redirected to the « Curve » menu which has been updated.

3 - DESCRIPTION OF MENUS

3.3.e. Silo maximum capacity

Definition

Sets the maximum capacity of the silo.



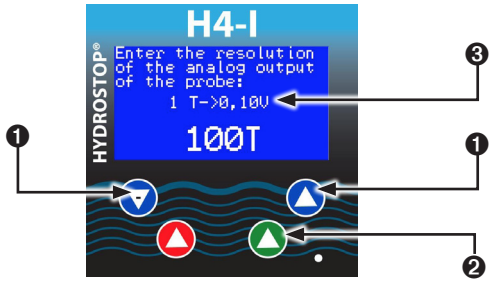
❶ Change the value.

❷ Validation.

3.3.f. Analog output settings

Definition

Set the maximum value returned by the analog output



❶ Change the value.

❷ Validation.

❸ Weight-Voltage correspondence for the current value.

3.3.g. Threshold settings

Definition

For each type of probe, a threshold (or 2 for the plasticity and silo weight) is configurable on the HBSR. Each box has 2 outputs allocated and will use the first as priority.

The top left box corresponds to the outputs 1 and 2.

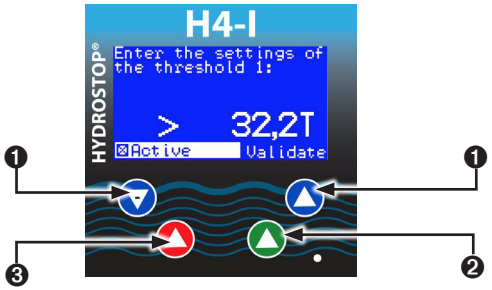
The top left box corresponds to the outputs 3 and 4.

The top left box corresponds to the outputs 5 and 6.

The top left box corresponds to the outputs 7 and 8.

Example: If a silo sensor is set to the box N°1, the threshold N°1 will be activated on the output N° 3 of the HBSR and will correspond to the bit N°2 of the word N°2 on the Modbus/TCP;and the threshold n°2 will correspond to the output N°4 of the HBSR and the bit N°3 of the word N°2.

A threshold can be configured to be activated when the measurement is above or below a set value.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on the sign, it allows you to set the activation threshold when the measurement is above or below the value. If the selection is on "Confirm", the threshold is set.

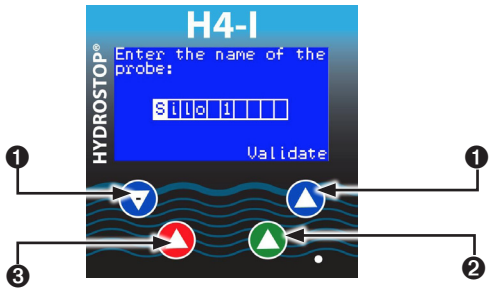
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3 - DESCRIPTION OF MENUS

3.3.h. Silo name

Definition

Set the name of the silo.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on "Confirm", the name is validated.

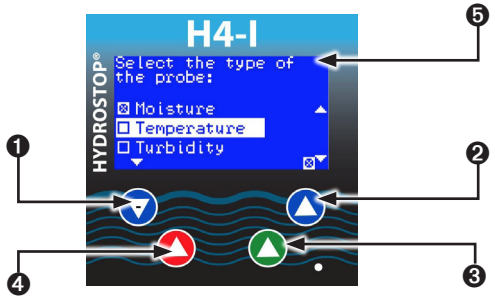
❸ If a value is set on « active » mode, this mode is exited and the character returns to its initial state. Otherwise, it exits the menu without saving changes.

3.3.i. Type of probe

Definition

The H4-I is fully configurable concerning the type of probe displayed. It is therefore possible to assign a sensor type to each box, according to the deported casing on the CAN bus. The various measurements available are: Moisture, silo weight, temperature, turbidity and concrete plasticity. This last one indicates also the temperature of the mixing and requires 2 boxes to be fully displayed thus limiting their number.

To assign a probe, just select the measurement on the screen, press the button assignment, and then validate.



❶ Shift the selection.

❷ Assign the selected type to the probe.

❸ Validation.

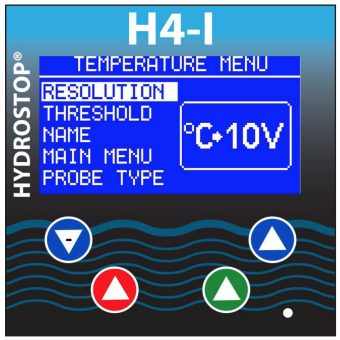
❹ Exit the menu without saving changes.

❺ Indication of additional values not displayed higher or lower depending on the symbols displayed.

3 - DESCRIPTION OF MENUS

3.4. Temperature probe advanced settings menu

The advanced setup menu can set specific options to each probe.



These options are:

Available without the « Administrator » code

« Administrator » code entry

MENU Main menu

Available with the « Administrator » code

°C↔10V Analog output settings

Threshold settings

Temperature probe name

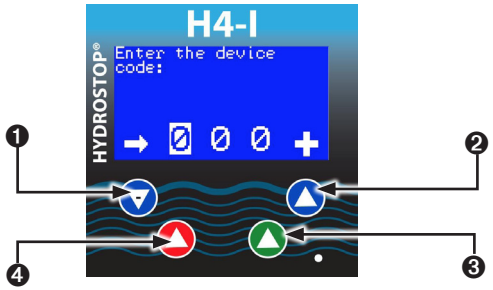
Type of probe

3.4.a. « Administrator » code entry

Definition

The "Administrator" code, when entered, allows the user to access to more settings, as the calibration of the probes. The basic code is "000". We advise you to change upon receipt of the display to limit the number of people who can change the settings (see Chapter 3.1.f.).

The "Administrator" code is a 3-digit code. When entered, it remains active for 5 minutes at the end of which it will need to be entered again in order to continue editing the advanced options of the device. This time can be shortened by using the"Locking device" option (see Chapter 3.1.e.).



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the3 basics options.

❹ Exit to the main menu.

3 - DESCRIPTION OF MENUS

3.4.b. Main menu

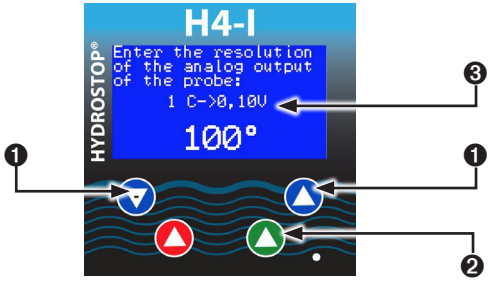
Definition

Provides access to the main menu of the H4-I. If the « Administrator » codeis not entered, this menu will not offer all its options.

3.4.c. Analog output settings

Definition

Set the maximum value returned by the analog output.



❶ Change the value.

❷ Validation.

❸ Temperature-Voltage correspondence for the current value.

3.4.d. Threshold settings

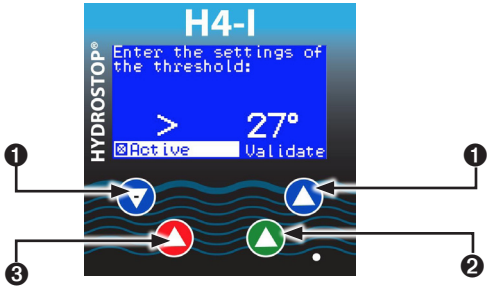
Definition

For each type of probe, a threshold (or 2 for the plasticity and silo weight) is configurable on the HBSR. Each box has 2 outputs allocated and will use the first as priority.

The top left box corresponds to the outputs 1 and 2.
The top left box corresponds to the outputs 3 and 4.
The top left box corresponds to the outputs 5 and 6.
The top left box corresponds to the outputs 7 and 8.

Example: If a the temperature is set on the box N°3, the threshold will be activated on the output N°7 of the HBSR and will correspond to the bit N°6 of the word N° 2 on the Modbus/TCP.

A threshold can be configured to be activated when the measurement is above or below a set value.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on the sign, it allows you to set the activation threshold when the measurement is above or below the value. If the selection is on "Confirm", the threshold is set.

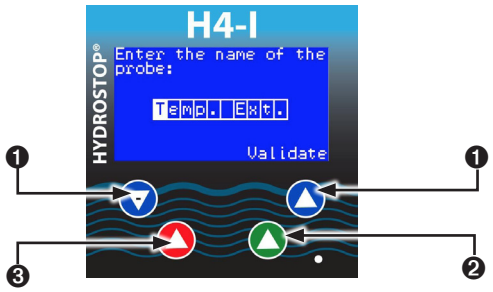
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3 - DESCRIPTION OF MENUS

3.4.e. Temperature probe name

Definition

Set the name of the temperature probe.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on "Confirm", the name is validated.

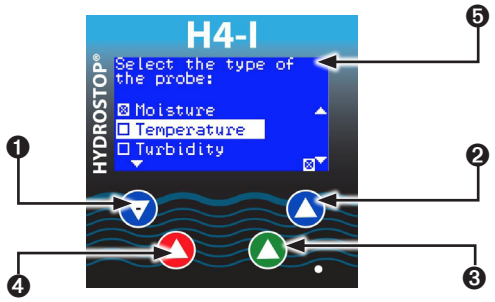
❸ If a value is set on « active » mode, this mode is exited and the character returns to its initial state. Otherwise, it exits the menu without saving changes.

3.4.f. Type of probe

Definition

The H4-I is fully configurable concerning the measures displayed. It is therefore possible to assign for each box a sensor type according to the deported casings on the CAN bus. The various measurements available are: Moisture, silo weight, temperature, turbidity and concrete plasticity. This last one indicates also the temperature of the mixing and requires 2 boxes to be displayed fully, thus limiting their number.

To assign a probe, just select the measurement on the screen, press the button assignment, and then validate.



❶ Shift the selection.

❷ Assign the selected type to the probe.

❸ Validation.

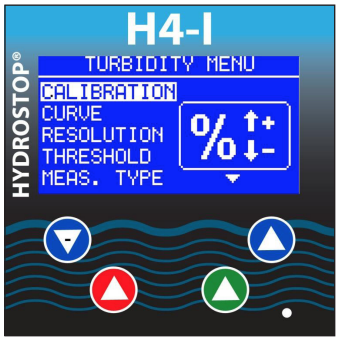
❹ Exit the menu without saving changes.

❺ Indication of additional values not displayed higher or lower depending on the symbols displayed.

3 - DESCRIPTION OF MENUS

3.5. Turbidity probe advanced settings menu

The advanced setup menu can set specific options to each probe.



These options are:

Available without the « Administrator » code

« Administrator » code entry

Calibration curve

MENU Main menu

Available without the « Administrator » code

Calibration

Analog output settings

Threshold settings

Measurement type

Turbidity probe name

Type of probe

Available as "Manual measurement"

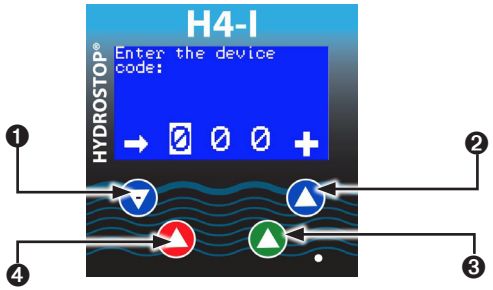
Manual value

3.5.a. « Administrator » code entry

Definition

The "Administrator" code, when entered, allows the user to access more settings, as the calibration of the probes. The basic code is "000". We advise you to change upon receipt of the indicator to limit the number of people who can change the settings (see Chapter 3.1.f.).

The "Administrator" code is a 3-digit code. When entered, it remains active for 5 minutes at the end of which it will need to be entered again in order to continue editing the advanced options of the device. This time can be shortened by using the "Locking device" option (see Chapter 3.1.e.).



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 3 basics options.

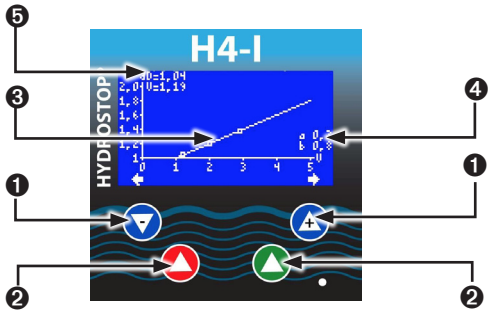
❹ Exit to the main menu.

3 - DESCRIPTION OF MENUS

3.5.b. Calibration curve

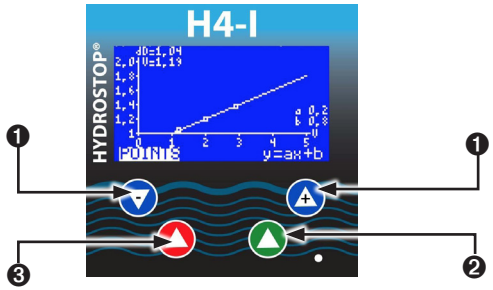
Definition

Display the equation of the calibration curve, the graph and the coordinates of all calibration points to assess their consistency.



❶ Shifts the selection. The selected point is the flashing one.
❷ Exit the menu.
❸ Graphical representation of the curve.
❹ Coefficients of the curve.
❺ Points coordinates (Flashing one).

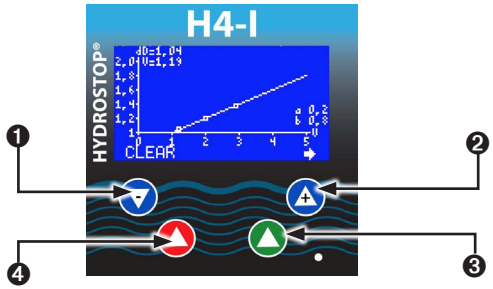
If the « Administrator » code is entered, this menu will offer more options:



❶ Shifts the selection.
❷ Enter in a secondary menu: Points management or Curve equation modification.
❸ Exit the menu. Every change will be saved.

Points control

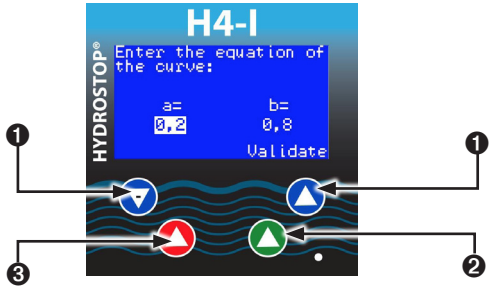
The « Points control » allows you to delete one or more calibration points in case of wrong calibration. To access it, simply select "Points" in the "Curve" menu:



❶ Delete the current point (flashing one).
❷ Select the next point.
❸ Validate changes and exits menu.
❹ Exit the menu without saving changes.

Curve equation modification

If you want to directly enter the coefficients of your curve, you must select the "y = ax+ b" in the "Curve" menu. You will then enter the following menu:



❶ Shift the selection or modify a value if it is in « active » mode.
❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", a confirmation will be required before your new equation will be considered.
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3 - DESCRIPTION OF MENUS

IMPORTANT:
The modification of the curve equation will delete all previously entered calibration points.

3.5.c. Main menu

Definition

Provides access to the main menu of H4-I. If the « Administrator » code is not entered, this menu will not offer all its options.

3.5.d. Calibration

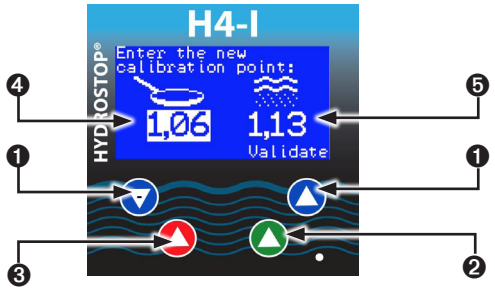
Definition

Add a new calibration point to the probe.

To calibrate, you must enter calibration points in the H4-I (read value and real value) and the system will calculate automatically the equation of the internal curve, from the 10 last points entered. In theory, two calibration points are enough. To be more accurate, these two points must be the furthest possible.

When you receive your H4-I system, the inner equation is for each channel: **y = 0.2x+1.0**. If this equation does not correspond to your sewage, where the calibration is as follows:

Determine in laboratory the turbidity of you loaded waters. To recall, the turbidity is equal to the weight of a sample of one liter of sewage.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Validate", the new point is validated and the curve is recalculated.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

❹ Turbidity value of the sample found in the laboratory.

❺ Turbidity value returned by the probe at the time of sampling.

A validation screen will appear for you to confirm the creation of the new point.
Confirm to create a new point.

IMPORTANT:
The calibration has been carried out using one turbidity value. To be precise, it is imperative to perform a second calibration value with a different turbidity.

IMPORTANT:
To save your calibration values in case of problems on the indicator, it is advisable to fill out the calibration of the system located in "Appendix E - Calibration Manual" at the end of this guide.

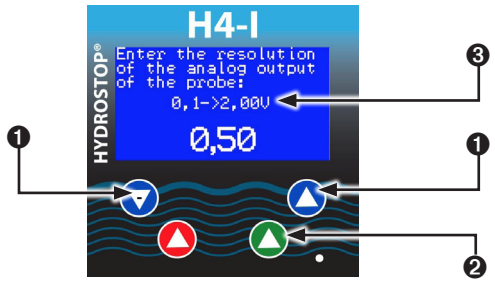
After confirming the creation of a new calibration points, you will be redirected to the « Curve » menu which has been updated.

3 - DESCRIPTION OF MENUS

3.5.e. Analog output settings

Definition

Set the maximum value returned by the analog output.



❶ Changes the value.
❷ Validation.
❸ Turbidity-Voltage correspondence for the current value.

CAUTION:
Turbidity cannot be less than 1.00, as the analogical output uses the value of 1.00 as a base value. Thus, if the probe is 1.26, the H4-I will send its analogical output the base value of 0.26. This device increases the accuracy by avoiding an unnecessary value range.

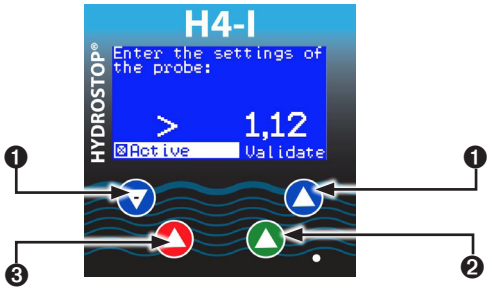
3.5.f. Threshold settings

Definition

For each type of probe, a threshold (or 2 for the plasticity and silo weight) is configurable on the HBSR. Each box has 2 outputs allocated and will use the first as priority.
The top left box corresponds to the outputs 1 and 2.
The top left box corresponds to the outputs 3 and 4.
The top left box corresponds to the outputs 5 and 6.
The top left box corresponds to the outputs 7 and 8.

Example: If a moisture is set to box 2, the threshold will activate HBSR output 5 and correspond to bit 4 of the word 2 on the Modbus/TCP.

A threshold can be configured to activate when the measurement is above or below a set value.



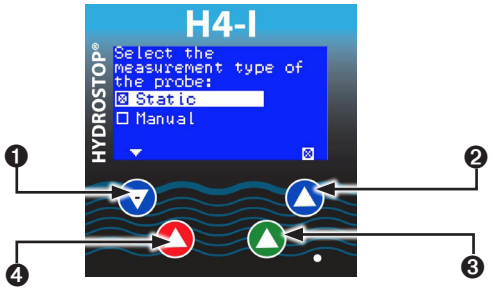
❶ Shift the selection or modify a value if it is in « active » mode.
❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on the sign, it allows you to set the activation threshold when the measurement is above or below the value. If the selection is on "Confirm", the threshold is set.
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3.5.g. Measurement type

Definition

Set the measurement type of the probe.
- **Static** : H4-I displays the instantaneous value measured by the probe and provides it to the analog outputs.
- **Manual** : H4-I displays a fixed value in the display and provides it on the analog output.

If a probe is configured as dynamic or manual measurement, it continues to display the instantaneous measurement made by the probe under the primary value. Changing the type of measurement modify the options in the setup menu of turbidity probe to allow the setting of options specific to each mode of operation.



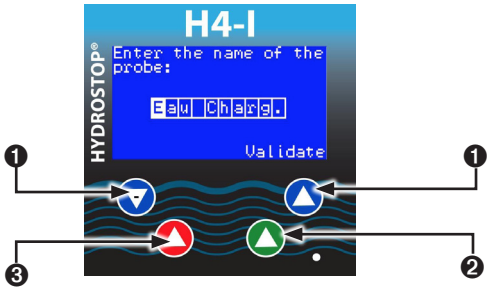
❶ Shifts the selection.
❷ Assigned the selected measurement type to the probe.
❸ Validates changes and exits menu.
❹ Exits the menu without saving changes.

3 - DESCRIPTION OF MENUS

3.5.h. Turbidity probe name

Definition

Set the name of the turbidity probe.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on "Confirm", the name is validated.

❸ If a value is set on « active » mode, this mode is exited and the character returns to its initial state. Otherwise, it exits the menu without saving changes.

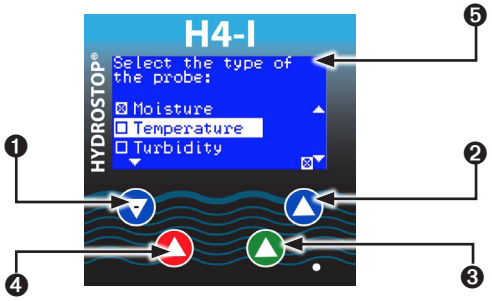
3.5.i. Type of probes

Definition

The H4-I is fully configurable for the type of probe displayed. It is therefore possible to assign of each box a sensor type according to the deported casings on the CAN bus. The various measurements available are: Moisture, silo weight, temperature, turbidity and concrete plasticity.

This last one indicates also the temperature of the mixture and requires 2 boxes to be displayed fully, thus limiting their number.

To assign a probe, just select the measurement on the screen, press the button assignment, and then validate.



❶ Shifts the selection.

❷ Assigns the selected type to the probe.

❸ Validation.

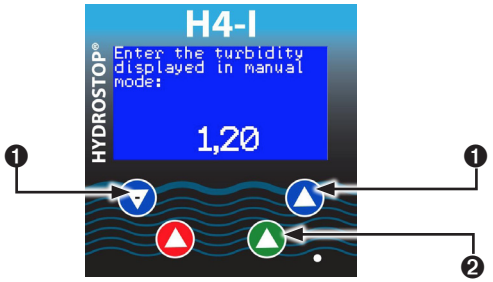
❹ Exits the menu without saving changes.

❺ Indication of additional values not displayed higher or lower depending on the symbols displayed.

3.5.j. Manual value

Definition

Sets the value assigned to the probe when it is in manual mode.



❶ Changes the value.

❷ Validation.

3 - DESCRIPTION OF MENUS

3.6. Plasticity probe advanced menu settings

The advanced setup menu can set specific options to each probe.

These options are:

Available without the « Administrator » code

« Administrator » code entry

MENU Main menu

Available with the « Administrator » code

Temperature settings

First filter settings

Second filter settings

Plasticity threshold settings

Temperature threshold settings

Type of probe

Available if the only probe displayed on the screen is plasticity probe

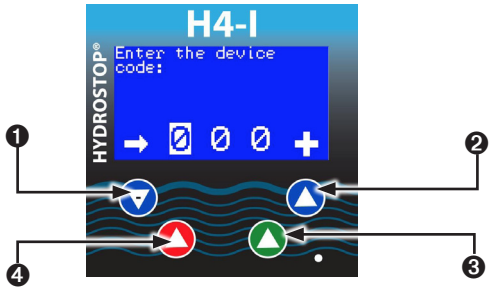
Zoom settings

3.6.a. « Administrator code entry

Definition

The "Administrator" code, when entered, allows the user to access more settings, as the calibration of the probes. The basic code is "000". We advise you to change upon receipt of the indicator to limit the number of people who can change the settings (see Chapter 3.1.f.).

The "Administrator" code is a 3-digit code. When entered, it remains active for 5 minutes at the end of which it will need to be entered again in order to continue editing the advanced options of the device. This time can be shortened by using the"Locking device" option (see Chapter 3.1.e.).



❶ Shift the selection to the right.

❷ Increase the selected digit by 1.

❸ Validate the displayed code. If this is correct, the main menu will reappear with all its parameters. Otherwise, you are always offered the 3 basics options.

❹ Exit to the main menu.

3 - DESCRIPTION OF MENUS

3.6.b. Main menu

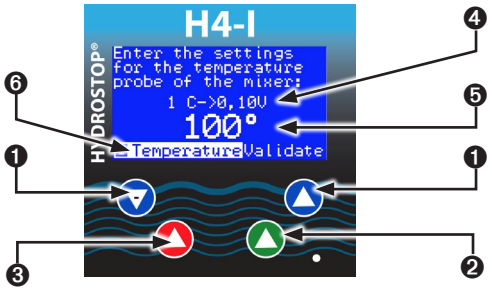
Definition

Provides access to the main menu of the H4 -I. If the « Administrator » code is not entered, this menu will not offer all its options

3.6.c. Temperature settings

Definition

Enables the input related to the temperature probe and adjusts the resolution of its analogical output.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is "Temperature", activation of the temperature probe changes state. If the selection is on "Confirm", the threshold is set.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

❹ Maximum value of the analog output.

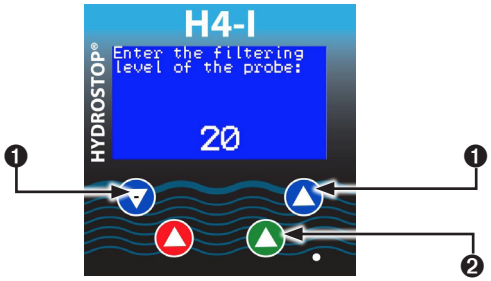
❺ Temperature-Voltage correspondence for the current value.

❻ Activation of the temperature probe.

3.6.d. First filter settings

Definition

Sets the value of the first filter applied to the measurement. The higher is this value, the smoother will be the measure;the changes will be more mitigated against their reactivity.



❶ Changes the value.

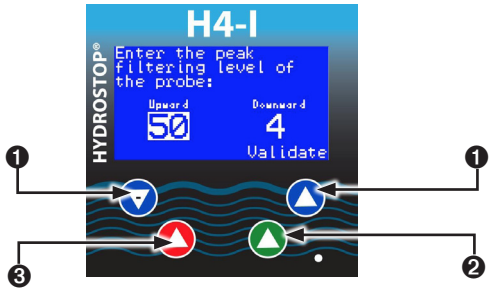
❷ Validation.

3.6.e. Second filter settings

Definition

Configures the values of the second filter applied to the measure. This filter attenuates the peaks achieved by the measure, either because the blade passed in front of the probe or another reason. The higher the value of each of these parameters, the lower the peaks in this direction will be taken into account.

CAUTION:
Setting too high values can lead to lower reactivity and thus the measure may take longer to reach its final value.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change. If the selection is on "Confirm", the threshold is set.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3 - DESCRIPTION OF MENUS

3.6.f. Plasticity threshold settings

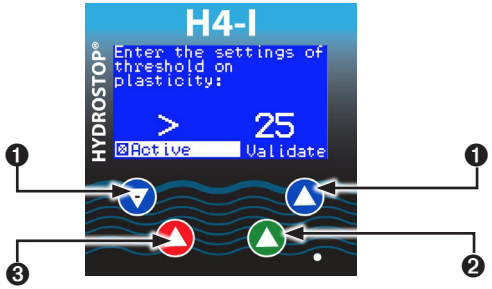
Definition

For each type of measure, a threshold (or 2 for the plasticity and silo weight) is configurable on the HBSR. Each bin has 2 outputs allocated and will use the first as priority.

The top left box corresponds to the outputs 1 and 2.
The top left box corresponds to the outputs 3 and 4.
The top left box corresponds to the outputs 5 and 6.
The top left box corresponds to the outputs 7 and 8.

Example: If the plasticity is set on box 1, the threshold will activate HBSR output 1 and corresponds to bit 0 of the word 2 on the Modbus/TCP.

A threshold can be configurated to be activated when the measurement is above or below a set value.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on the sign, it allows you to set the activation threshold when the measurement is above or below the value. If the selection is on "Confirm", the threshold is set.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3.6.g. Temperature threshold settings

Definition

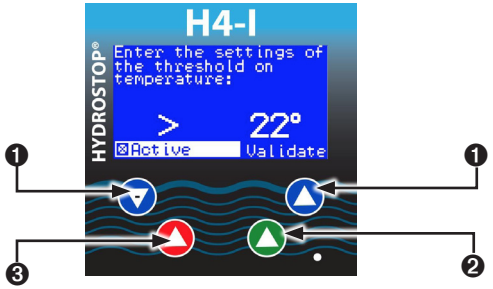
For each type of measure, a threshold (or 2 for the plasticity and silo weight) is configurable on the HBSR. Each bin has 2 outputs allocated and will use the first as priority.

The top left box corresponds to the outputs 1 and 2.
The top left box corresponds to the outputs 3 and 4.
The top left box corresponds to the outputs 5 and 6.
The top left box corresponds to the outputs 7 and 8.

Example: If a moisture is set to box 1, the threshold will activate HBSR output 1 and correspond to bit 0 of the word 2 on the Modbus/TCP.

A threshold can be configured to be activated when the measurement is above or below a set value.

3 - DESCRIPTION OF MENUS



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is on the sign, it allows you to set the activation threshold when the measurement is above or below the value. If the selection is on "Confirm", the threshold is set.

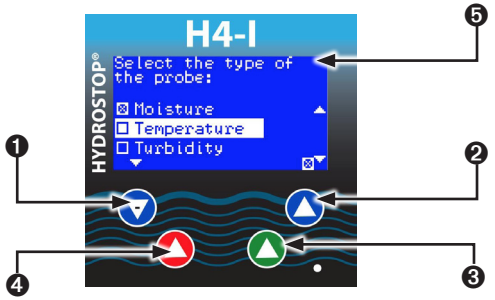
❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

3.6.h. Type of probe

Definition

The H4-I is fully configurable for the type of measure displayed. It is therefore possible to assign to each bin a sensor type according to the deported casings on the CAN bus. The various measurements available are: Moisture, silo weight, temperature, turbidity and concrete plasticity.
This last one indicates also the temperature of the mixture and requires 2 boxes to be displayed fully, thus limiting their number.

To assign a probe, just select the measurement on the screen, press the button assignment, and then validate.



❶ Shifts the selection.

❷ Assigns the selected measure to the current box.

❸ Validation.

❹ Exits the menu without saving changes.

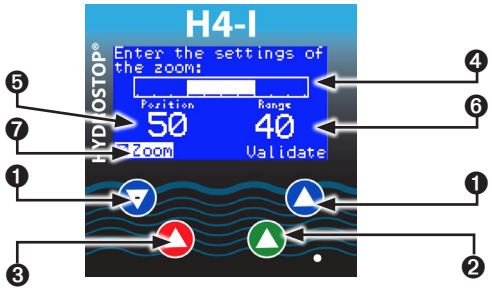
❺ Indication of additional values not displayed higher or lower depending on the symbols displayed.

3 - DESCRIPTION OF MENUS

3.6.i. Zoom settings

Definition

If the only measure displayed on the screen of the H4-I is the plasticity, it is possible to assign it a zoom. It will take the form of a second bargraph displaying the measure in a certain measure range in which it is more accurate. This menu allows you to enable this option and to configure it according to the desired operation.



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the changeIf the selection is "Zoom", activation of the zoom changes state. If the selection is on "Confirm", the threshold is set.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

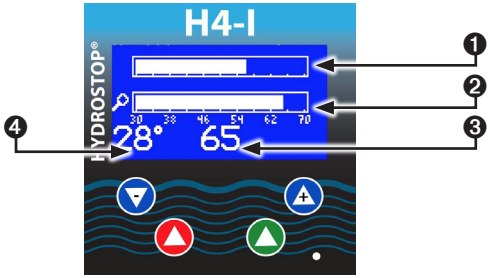
❹ Graphical representation of the zoom range.

❺ Value around which focuses the zoom range.

❻ Width of the zoom range.

❼ Zoom activation.

With the « Zoom » option activated, the main screen will appears as:



❶ Graphical representation of the bargraph.

❷ Zoom on the defined range of the bargraph.

❸ Numerical measure value.

❹ Mixture temperature measured by the probe.

4 - DESCRIPTION OF FAULTS

When the system malfunctions the H4-I displays a pictogram representing the fault, in order to provide the user with an indication of the check that needs to be carried out to resolve the fault.


4.1. Probe level fault

Definition

When the H4 -I displays one of this pictogram over a moisture bin, a silo weight bin or a turbidity bin this means that there is a voltage level fault on the probe linked to this bin.

Then, enter the main menu of the device and then select the "voltmeter".

If the voltage level of the probe is 0.05 V, this means that there is a problem with connections to the probe. Then check that the connector on the back of it is tight. If so, it is necessary to control the connector located inside the deported casing, it can be removed or it can be a wire improperly tightened which may have been withdrawn from the slot.
If, after checking, none of these defects is obvious, this means that the probe is faulty. Then please contact HYDROSTOP support.

If the probe level is 7.97 V for a moisture probe or 5V for the other, the probe is faulty and must be returned to the company HYDROSTOP to be repaired.

4.2. Out-of-calibration alarm

Definition

When the H4-I displays this pictogram over a moisture box, a silo weight box or a turbidity box, this means that the displayed value is outside the calibrated range. It is therefore advisable to make a new calibration to control the measure system. If it turns out that the measure is correct, then it is possible to enter a new point corresponding to this new value in order to stop the alarm.

4.3. Empty bin alarm

Definition

When the H4-I displays this pictogram over a moisture box, this means that the measure of the probe is less than or equal to the threshold set to empty bin. The level of the analog output will not fall below this threshold.

4.4. Communication loss fault

Definition

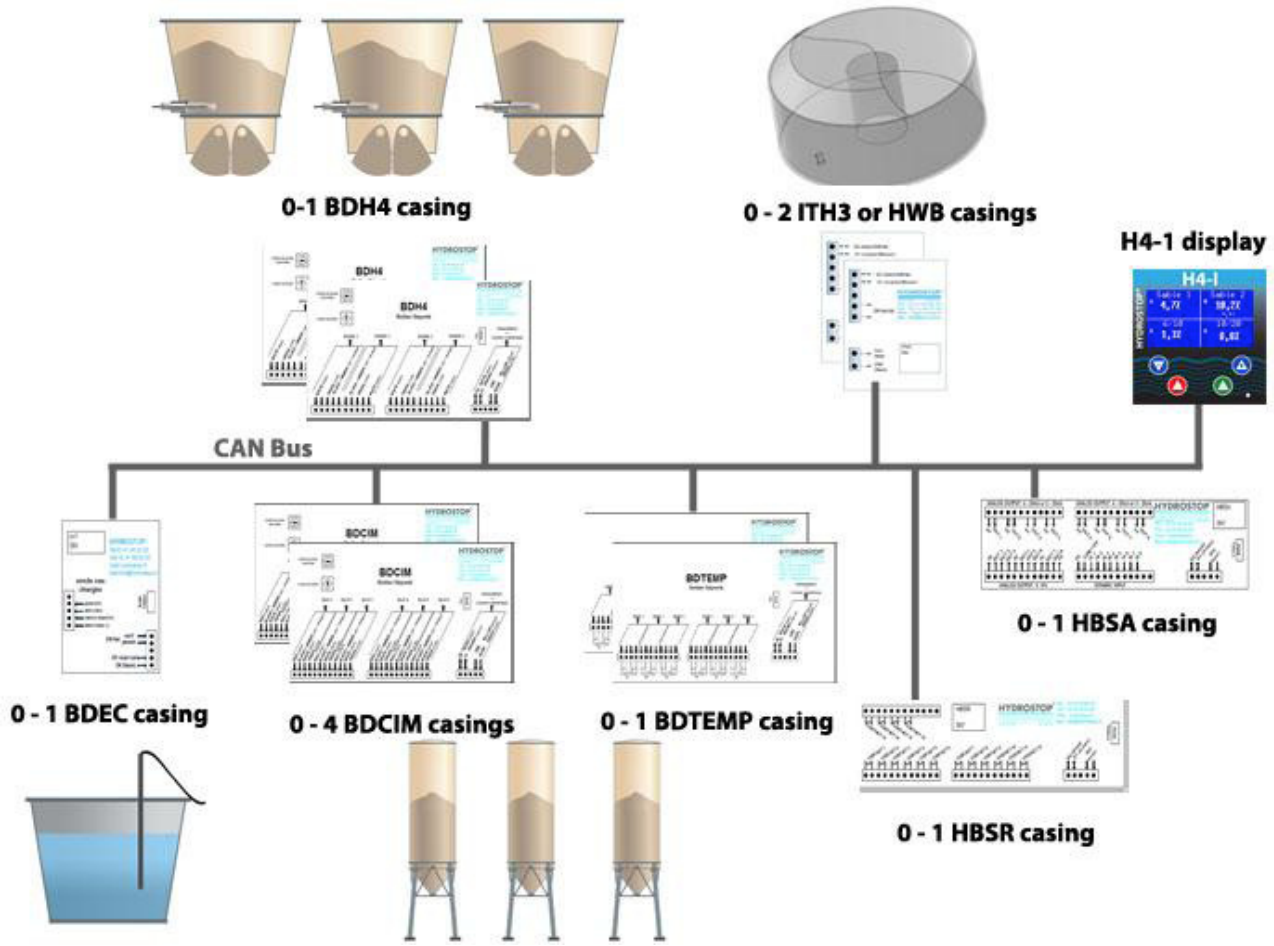
When the H4 -I display this pictogram over a box, this means there is a communication loss with the corresponding deported casing.

If the fault is general, check the connection of the "double twisted pair" cable on the back of the display, it can be removed or a wire may have been withdrawn from its slot. If not, check the cable wholeness to verify that it has not been cut or damaged.
If the fault is only present on a box or on boxes of the same type, check the connection of the "double twisted pair" cable on the matching deported casing, it can be removed or a wire may have been withdrawn from its slot. If not, check the wholeness of the cable to verify that it has not been cut or damaged.

If after these checks, no faults were found, please contact the after-sale service of the company HYDROSTOP.

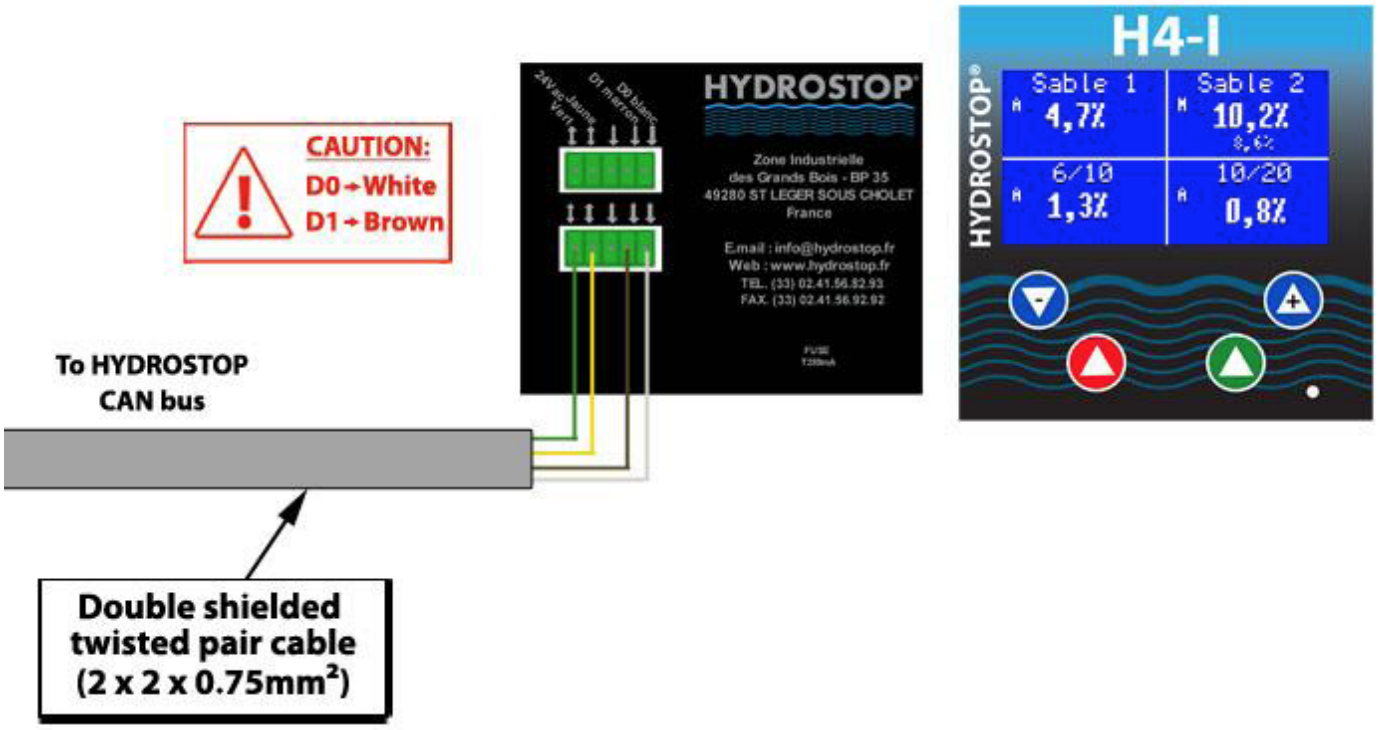
5 - CONNECTION DIAGRAM

5.1. CAN network



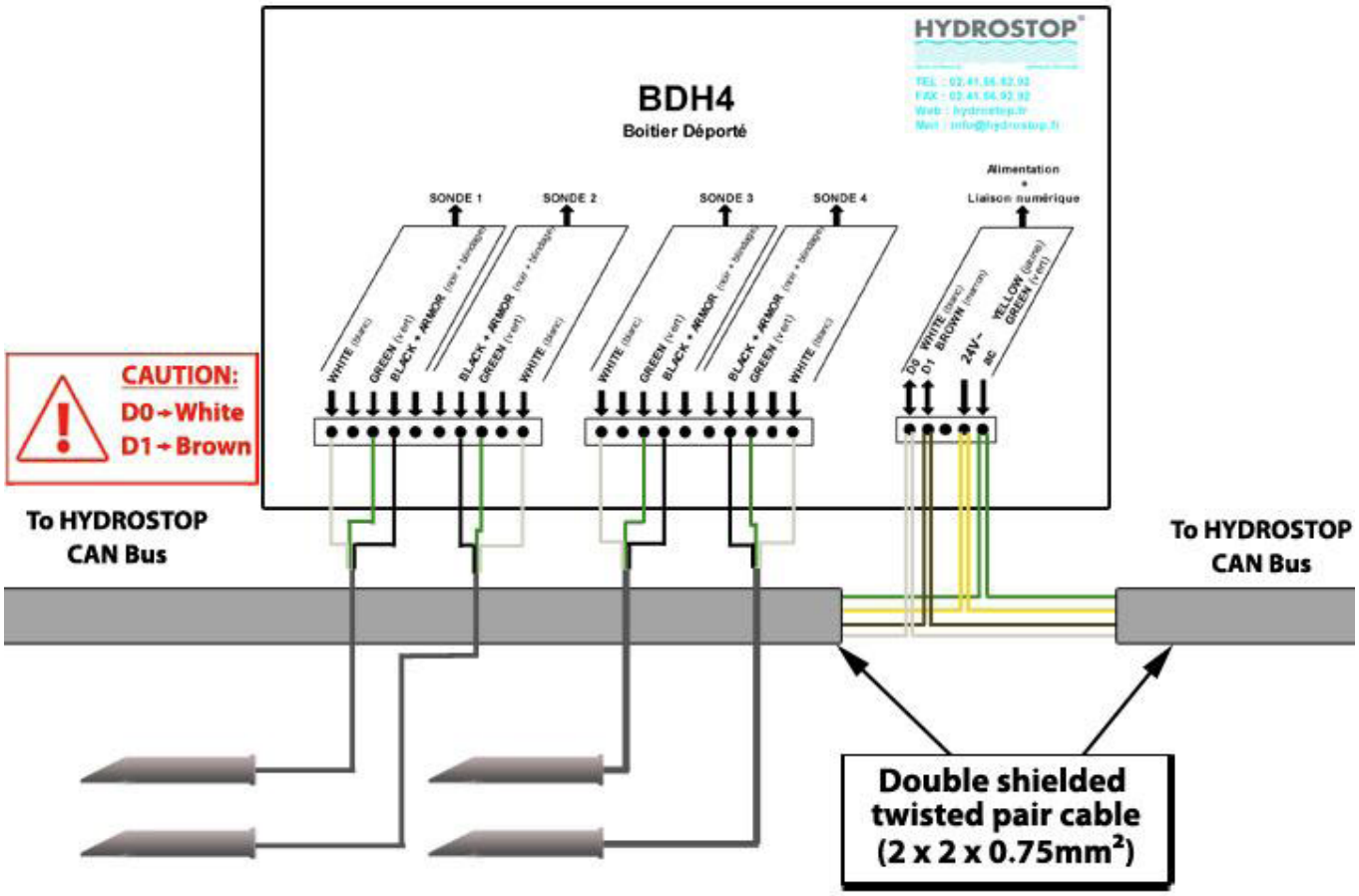
5 - CONNECTION DIAGRAM

5.2. H4-I



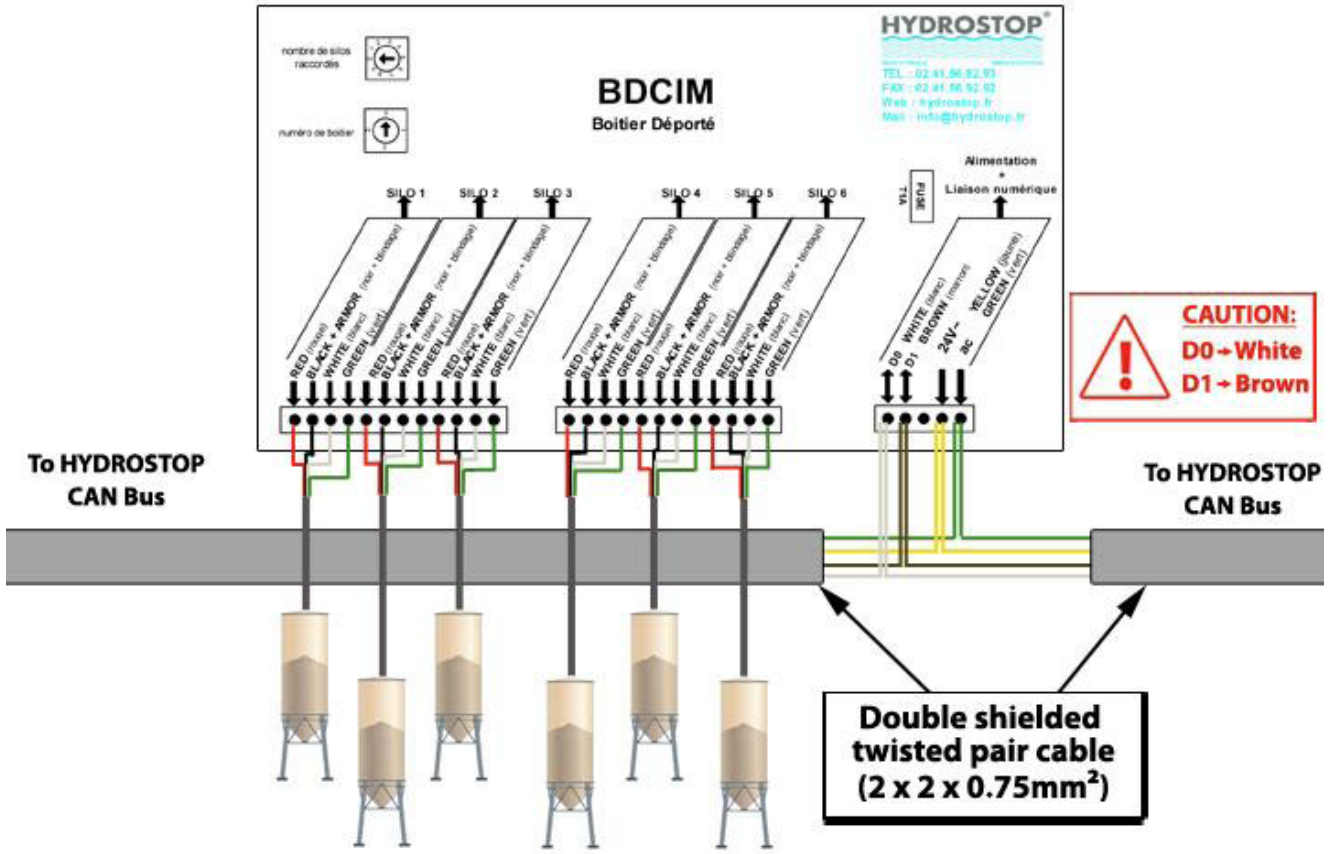
5 - CONNECTION DIAGRAM

5.3. BDH4



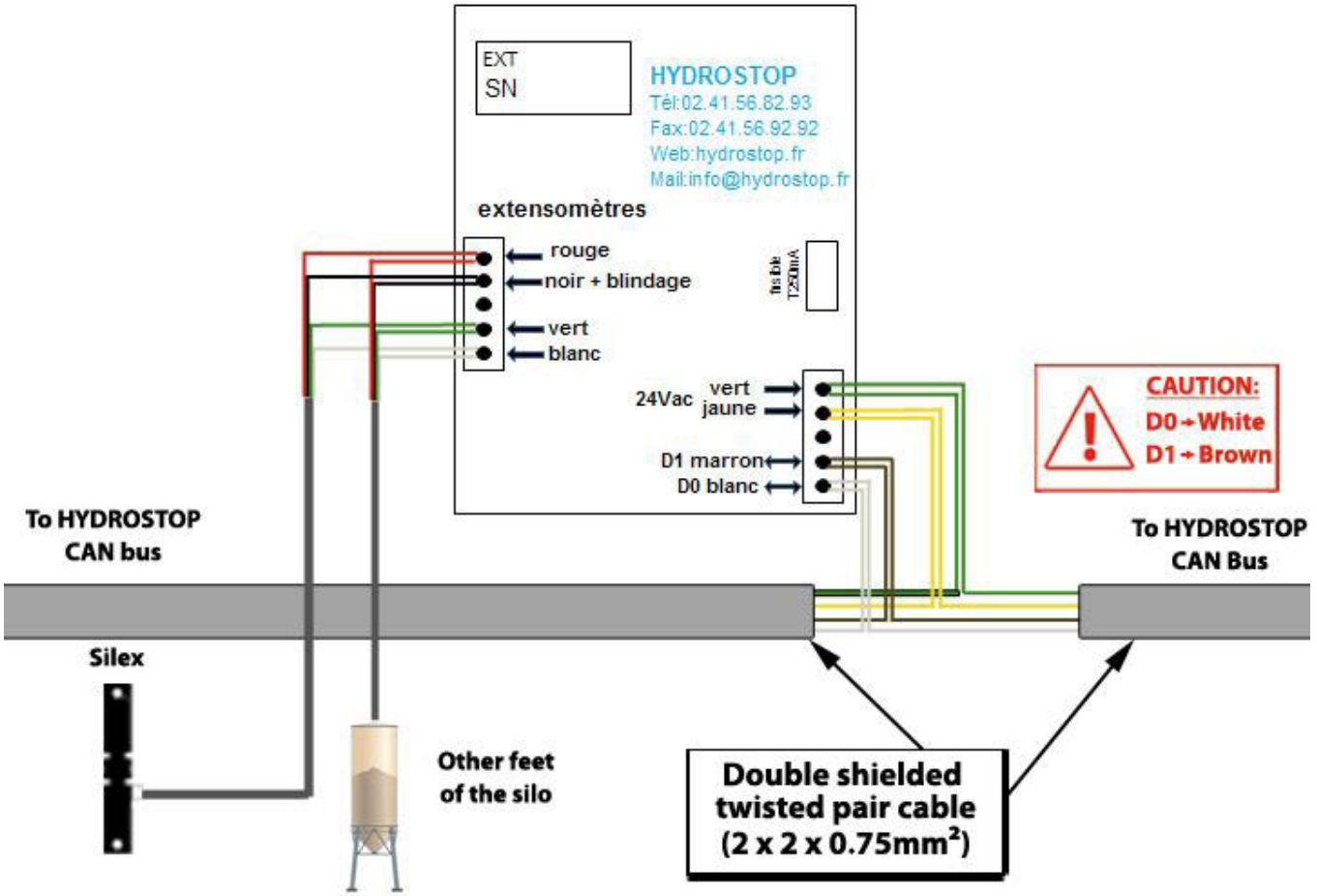
5 - CONNECTION DIAGRAM

5.4. BDCIM MULTI-INPUT



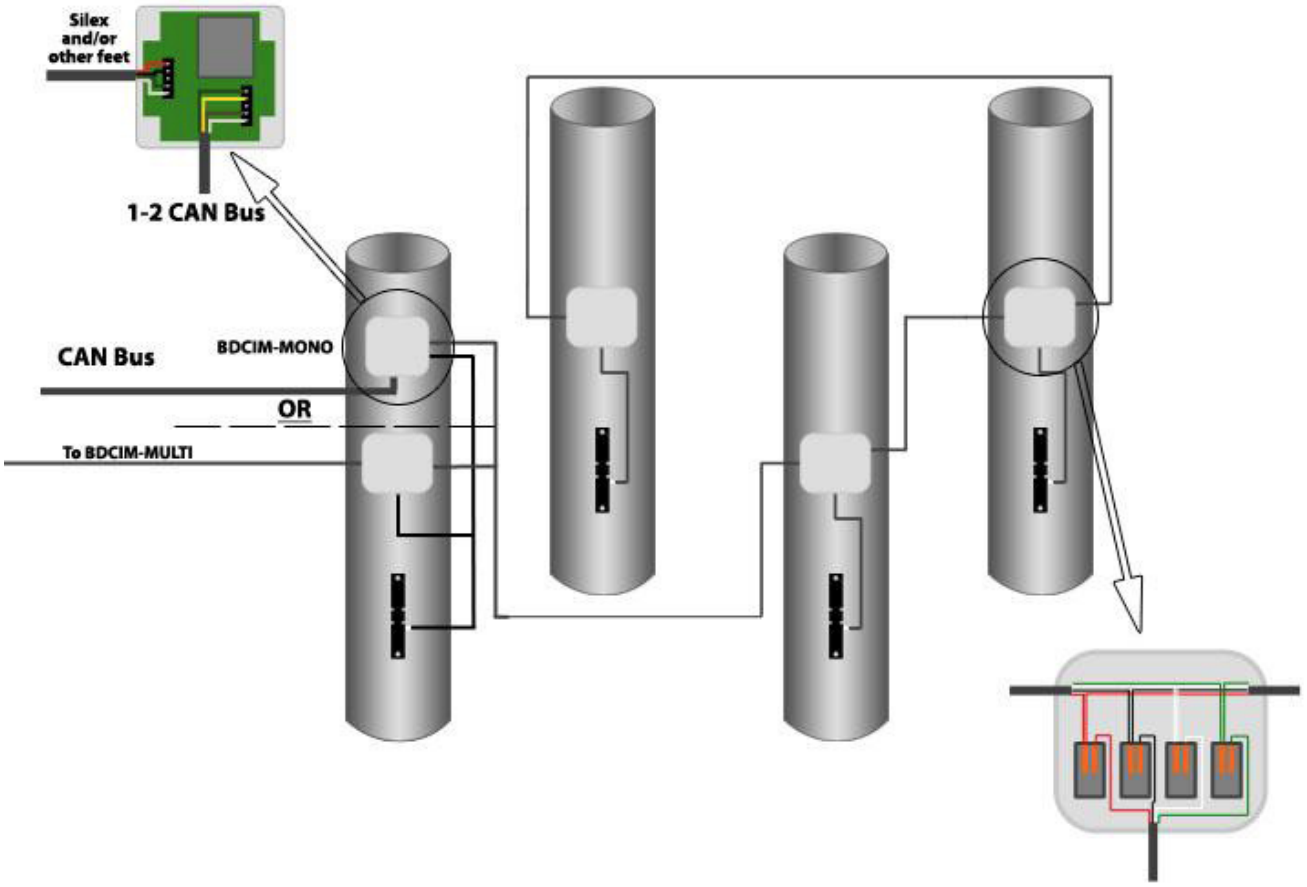
5 - CONNECTION DIAGRAM

5.5. BDCIM MONO-INPUT



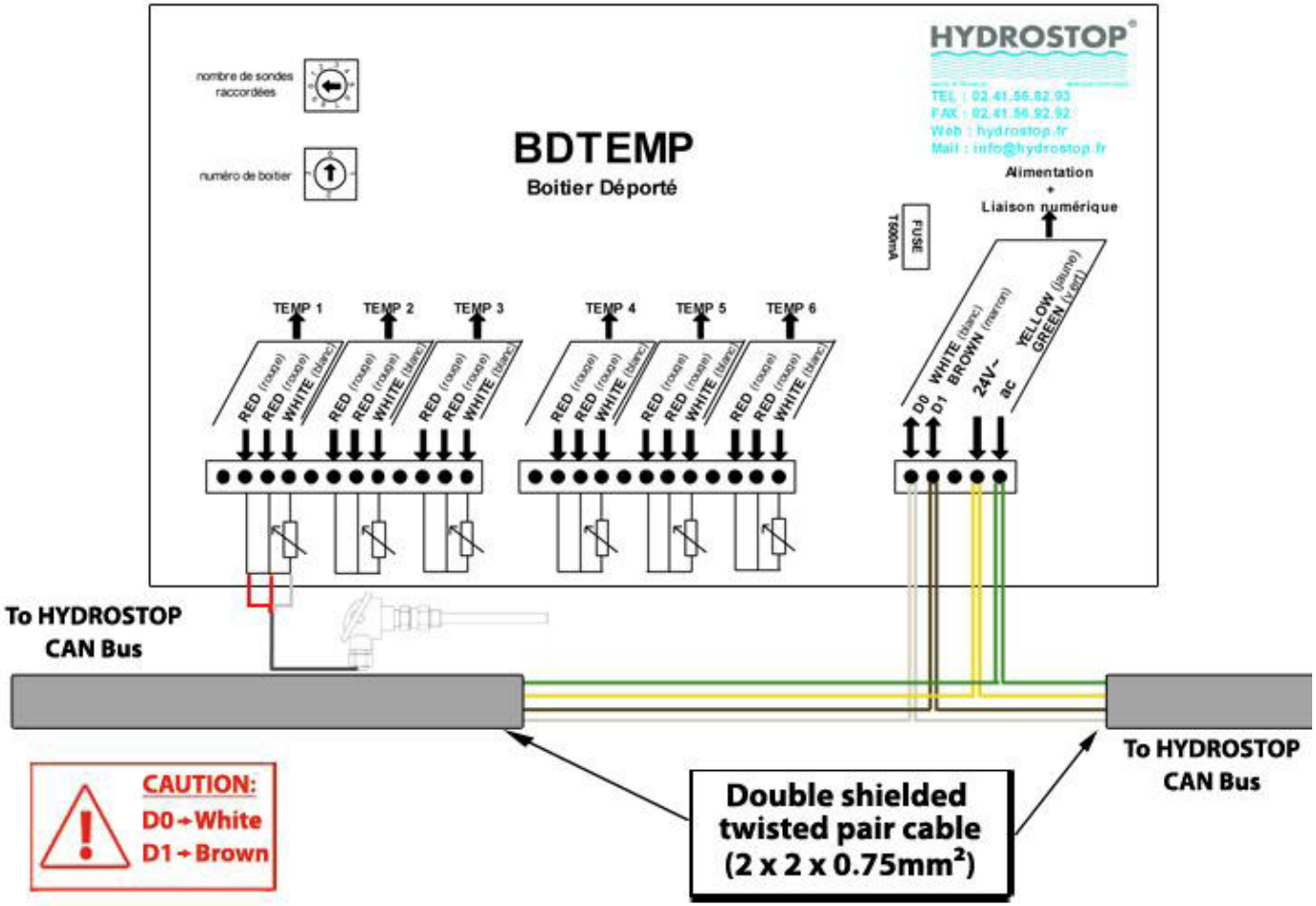
5 - CONNECTION DIAGRAM

5.6. Flint junction box



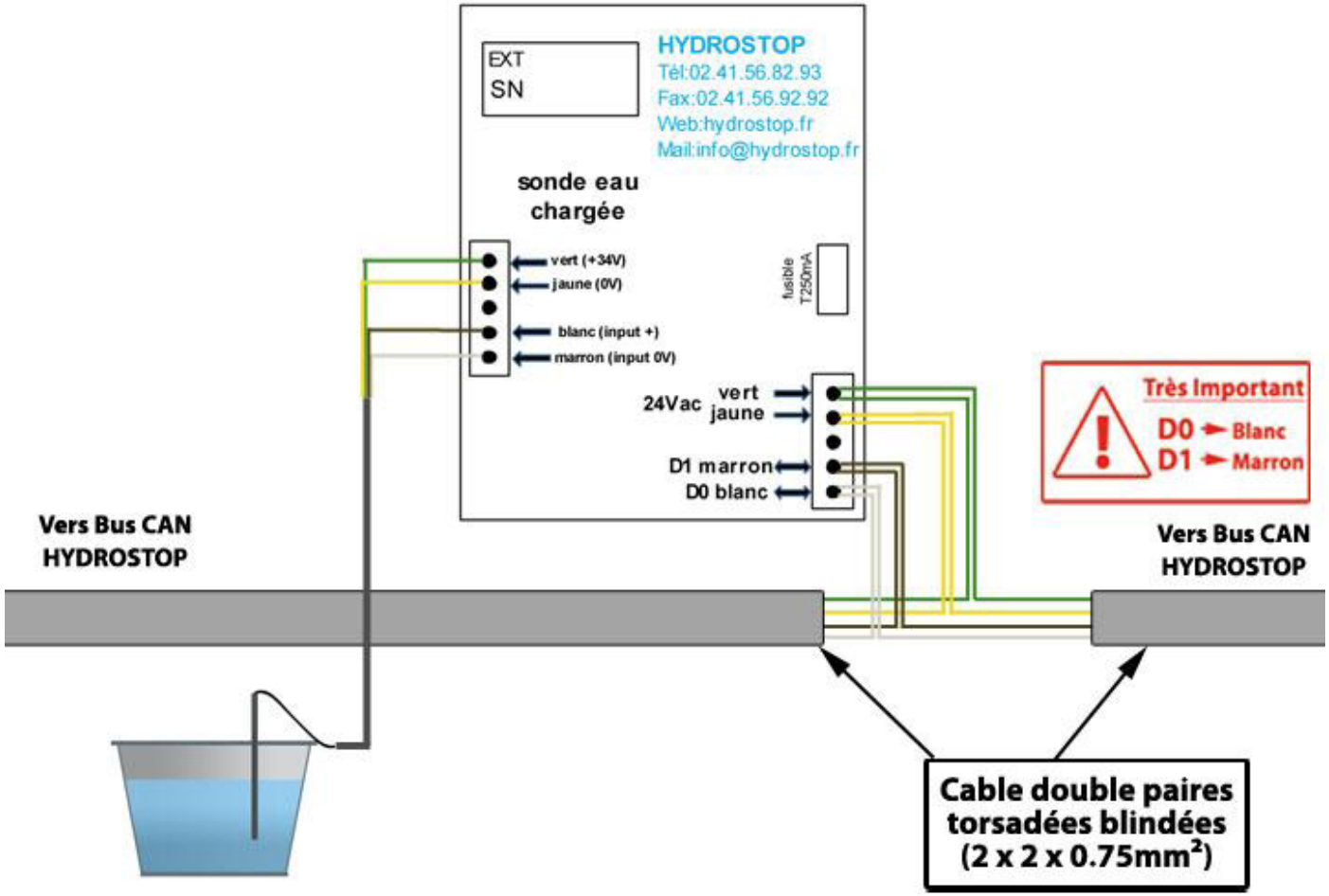
5 - CONNECTION DIAGRAM

5.7. BDTEMP



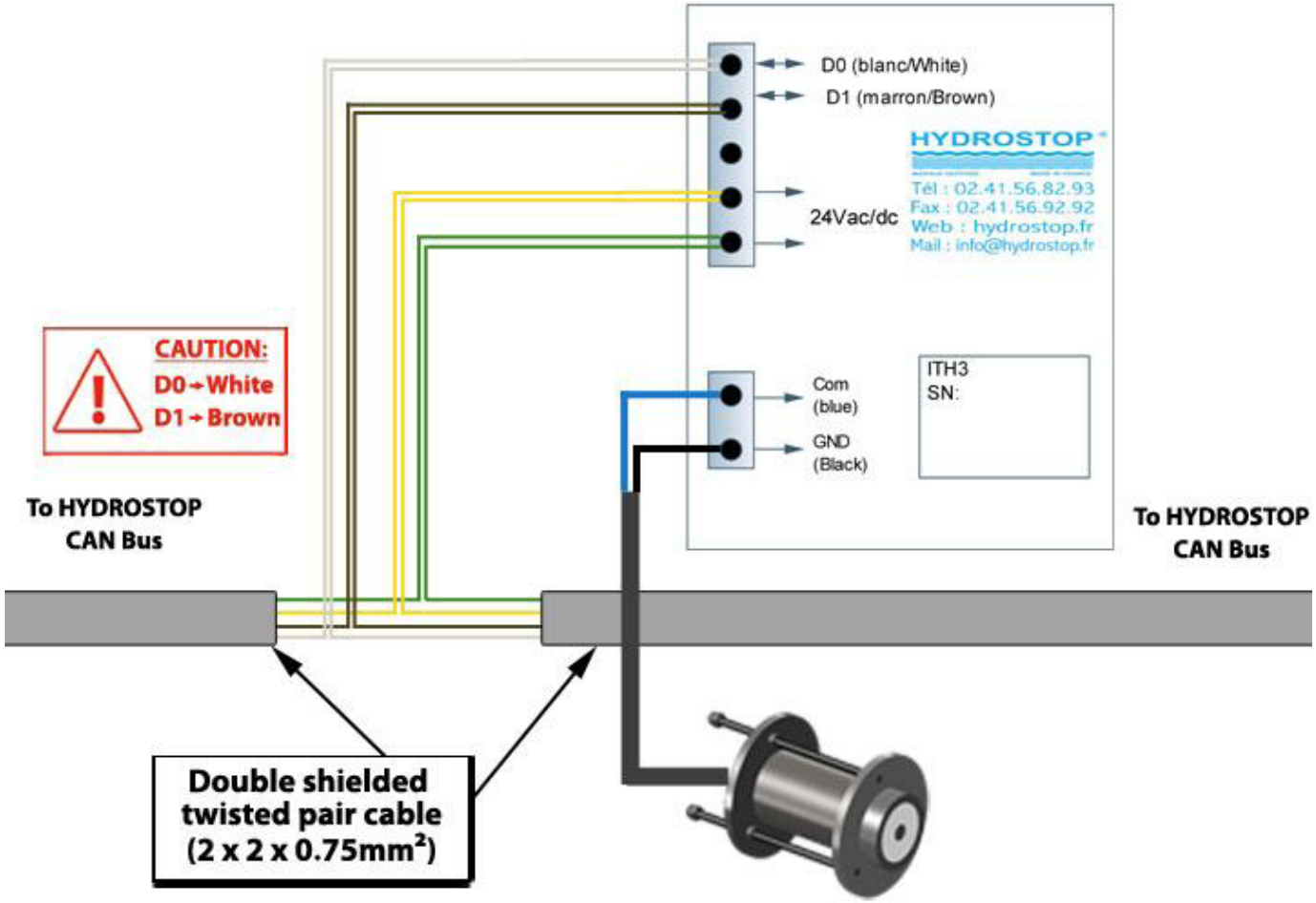
5 - CONNECTION DIAGRAM

5.8. BDEC



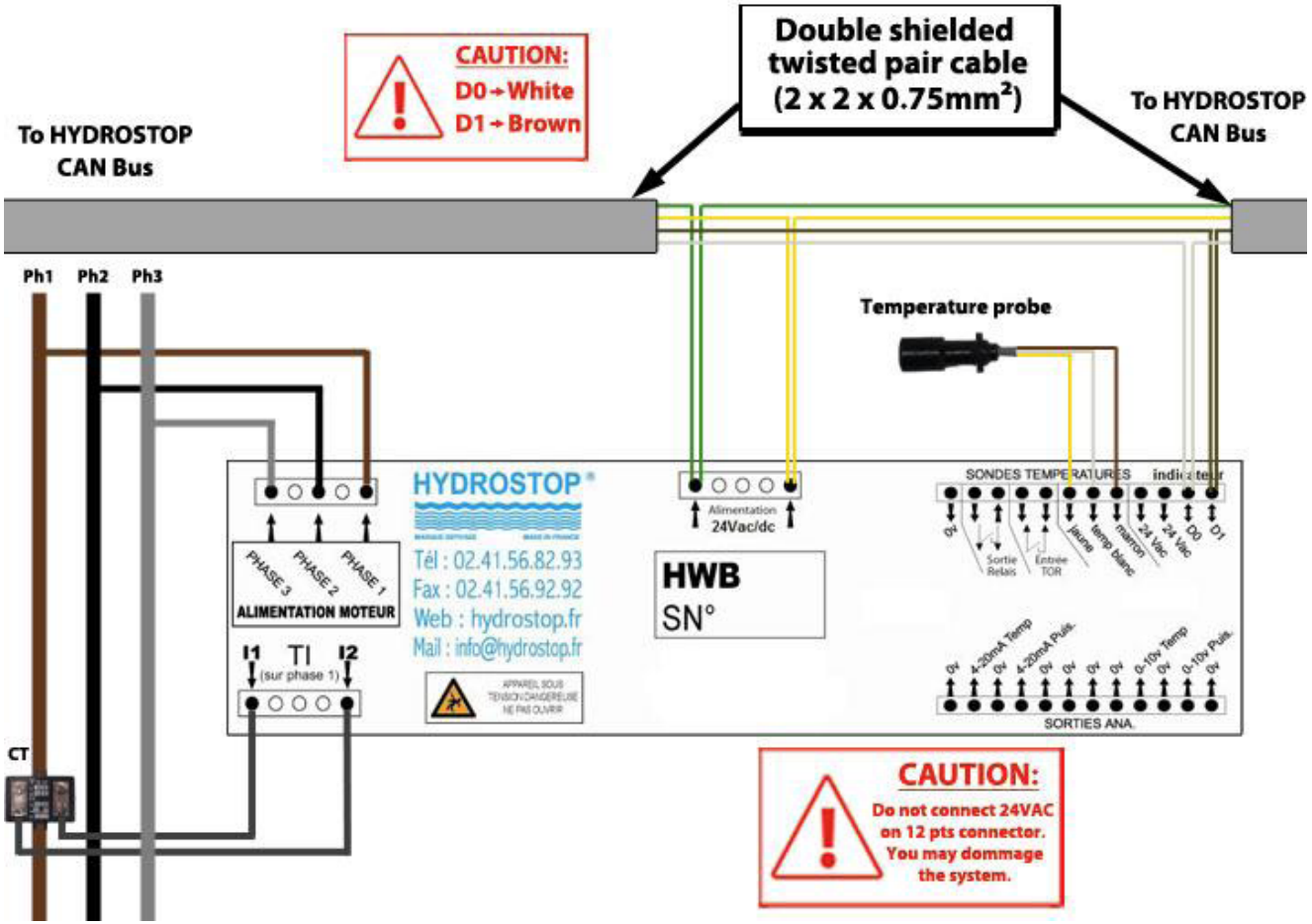
5 - CONNECTION DIAGRAM

5.9. ITH3



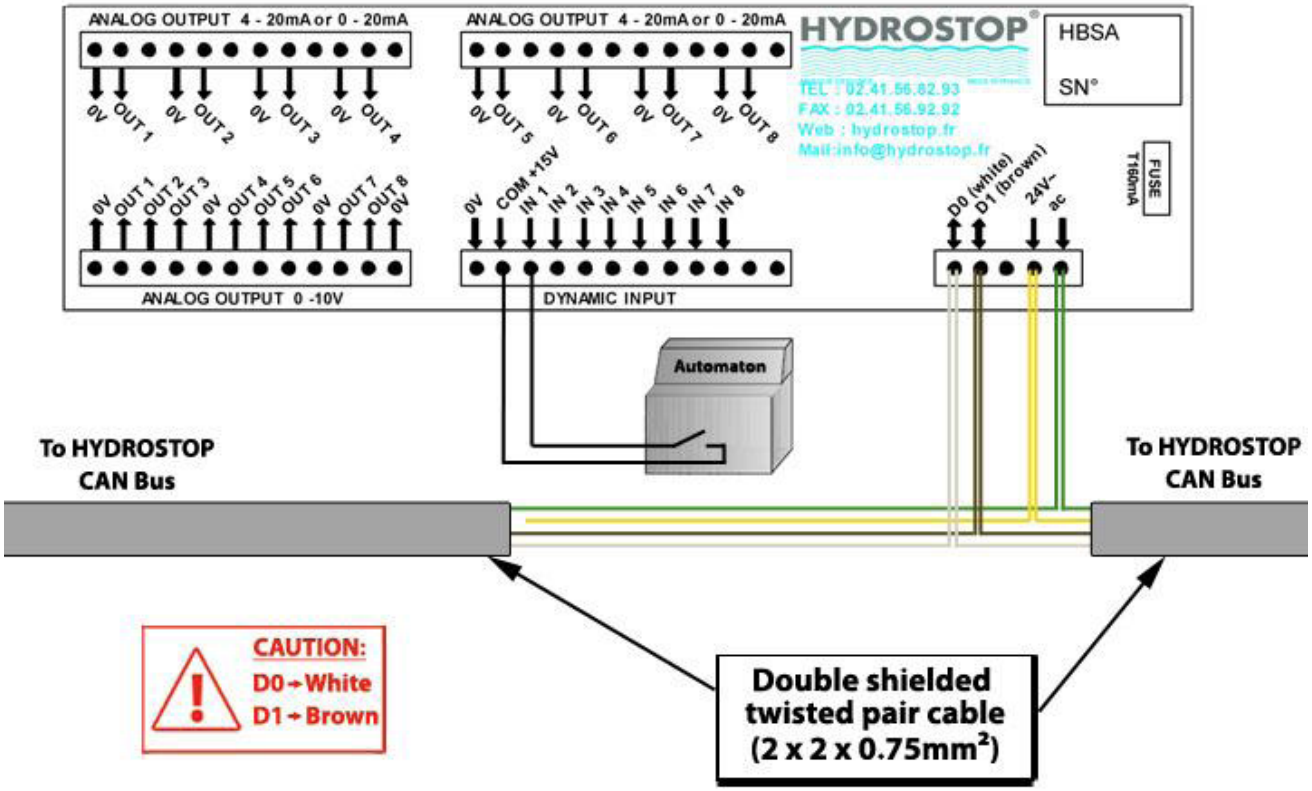
5 - CONNECTION DIAGRAM

5.10. HWB



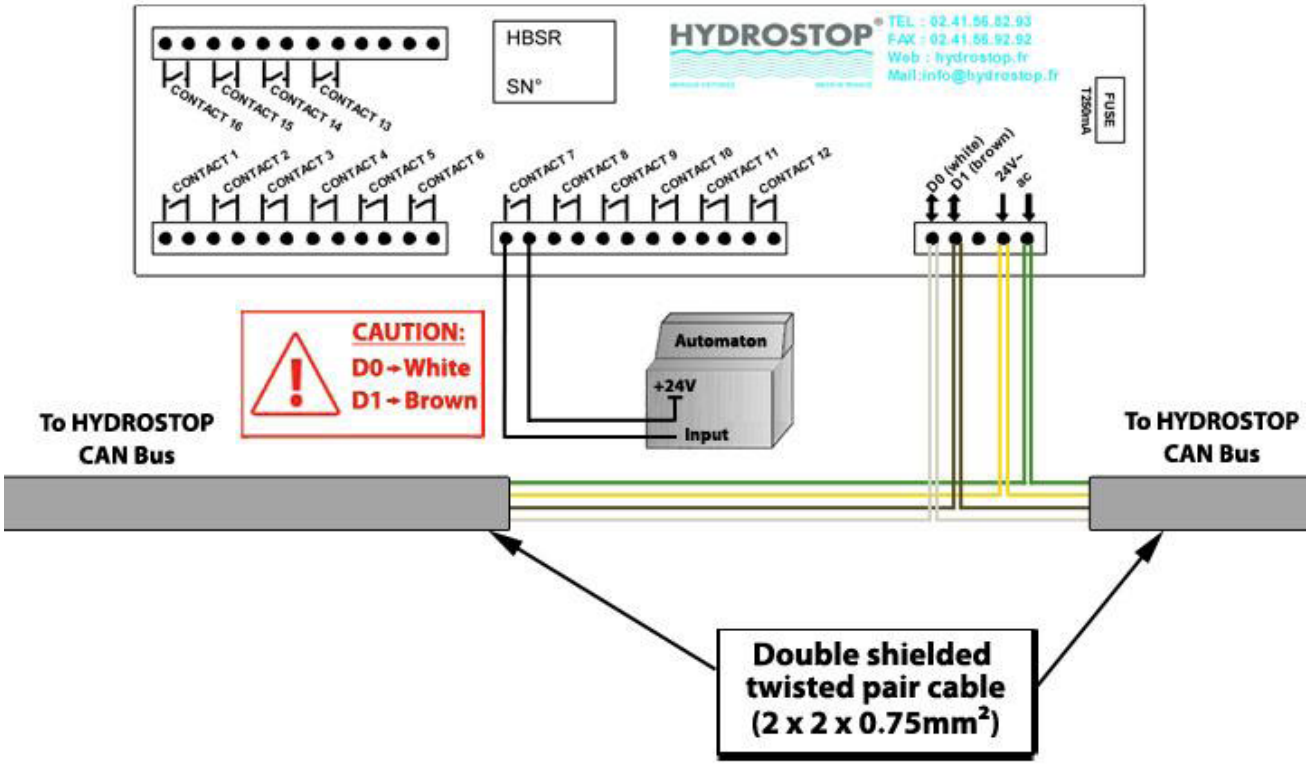
5 - CONNECTION DIAGRAM

5.11. HBSA



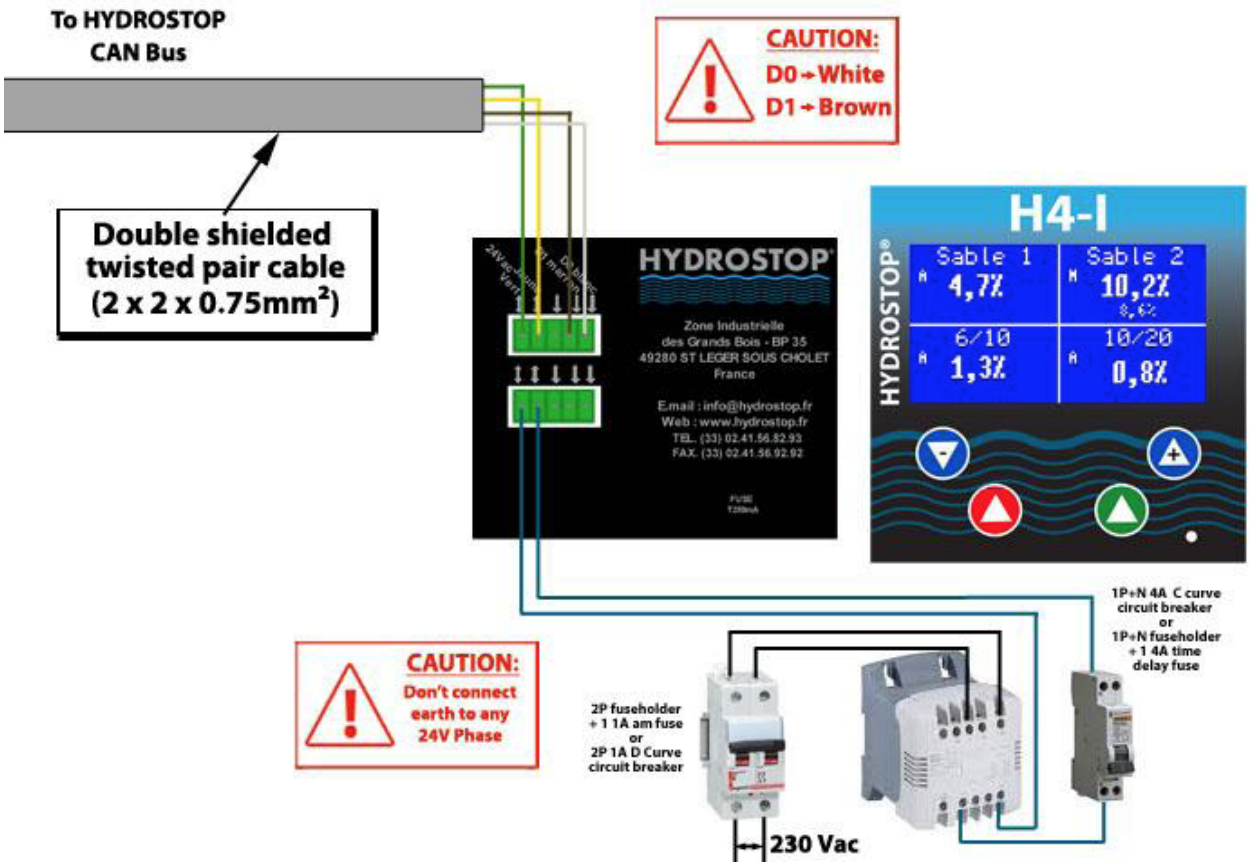
5 - CONNECTION DIAGRAM

5.12. HBSR



5 - CONNECTION DIAGRAM

5.13. Transformer



6 - ELECTRICAL FEATURES

Characteristics of system components :
Terms of installation : 40°C max. ambient relative humidity of 80 % / 31°C, 50 % / 40°C et max. altitude 2000 m.
The system is powered by 24V AC 50Hz/60Hz provided by the transformer which is connected to the 230V AC 50Hz/60Hz of the network. Its output must be connected to the yellow and green wired of the "double twisted pair" cable to one of the node of the CAN bus.

MO2 Microwave probe
- Mechanical characteristics: Tighten using a set screw located on the mounting sleeve, which is welded to the bin
- Electrical characteristics: the probe is wired to the BDH4 deported casing with a cable supplied by the company HYDROSTOP. Its length is 10m it is composed of five wires and shielding distributed as follows :
  - White wire: feedback signal from the probe. Its voltage varies between 0V and 10V.
  - Green wire: 12 V signal
  - Black wire : 0 V signal
  - Shielding

IMPORTANT:
The RED and BLUE wires are not used and should not therefore be connected to the deported casing. The shielding is connected to the black Wire at deported casing level. It should also be noted that the shielding is linked to the connector at probe level.

A chain with a hook is provided to connect the probe to its support, allowing a hooking of the probe in case of fall.

BDH4 deported casing
- Mechanical characteristics: It is a plastic box that can be assembled outside (IP55). It should be mounted as close to the probes as possible. It is mounted by welding it on to the bin framework.
- Electrical characteristics: Four MO2 probes can be connected on the BDH4 with the abovementioned cable. It is powered via the "shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

Flint weighing probe
- Mechanical characteristics: Tighten with a set of screw and washer on the pad with a torque of 54Nm. These studs are welded to the foot of the silo
- Electrical characteristics: The probe is connected to a junction box. All the Flints are wired in parallel and connected to the BDCIM deported casing. The provided cable is 2m long but can be shortened. It is composed of 4 wires and a shielding distributed as follows:
  - Re wire : 12V Signal
  - Black wire : 0V Signal
  - White wire : negative output of the differential signal
  - Green wire : positive output of the differential signal
  - Shielding

IMPORTANT: The shielding is connected to the black wire in the junction box with the WAGO connector and in the BDCIM deported casing. It should also be noted that the shielding is linked to the connector at probe level.

BDCIM-Multi deported casing
- Mechanical characteristics: It is a plastic box that can be assembled outside (IP55). It should be mounted as close to the silos as possible. It is mounted by welding it on to a silo foot.
- Electrical characteristics: Up to six Flint probes can be connected on the BDCIM-Multi with the abovementioned cable. It is powered via the "shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

The BDCIM-Multi deported casing has a 1A delay fuse.

BDCIM-Mono deported casing
- Mechanical characteristics: It is a plastic box that can be assembled outside (IP55). It should be mounted on a foot of the silo and works as one of the junction box.
- Electrical characteristics: One Silex probe can be connected on the BDCIM-Mono with the abovementioned cable. It is powered via the "shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

The BDCIM-Mono deported casing has a 250mA delay fuse.

6 - ELECTRICAL FEATURES

PT-100 temperature probe

- Mechanical characteristics: Provided in a thermowell. It is screwed into a ring welded to the body of the silo. For maintenance, only the inner part of the sensor must be removed to maintain the sealing of the silo.
- Electrical characteristics: the probe is wired to the BDTEMP deported casing with a cable not included. This cable must have at least 3 wires to connect to the red and white terminals of the probe. It should be as short as possible to avoid drift measurement. The terminal of the probe corresponds to :
- Red terminals: differential signal. The 2 wires compensate the cable length
- White terminal: differential signal

Deported casing BDTEMP

- Mechanical characteristics: It is a plastic box that can be assembled outside (IP55). It should be set as close as possible to the probes. It is mounted by welding.
- Electrical characteristics: Up to six PT-100 probes can be connected on the BDTEMP. It is powered via the "shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

The BDCIM-Multi deported casing has a 500mA delay fuse.

MES turbidity probe

- Mechanical characteristics: Supplied with installation kit. It is screwed into a rod to dive into the recovery tank.
- Electrical characteristics: The probe is connected to a junction box which powers it and adapts its output. This box is wired to the BDEC deported casing and sends to it an image of the measure. The box must be wired to the junction box with the supplied cable. The cable between the deported casing and the junction box must be composed of at least 4 wires:
  - 2 power wires
  - 2 measure wires

BDEC deported casing

- Mechanical characteristics: It is a plastic box that can be assembled outside (IP55). It should be set as close as possible of the probe. It is mounted by welding.
- Electrical characteristics: One turbidity probe can be connected on the BDEC with the abovementioned cable. It is powered via "shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

The BDEC deported casing has a 250mA delay fuse.

H3 plasticity probe

- Mechanical characteristics: Supplied with installation kit. It needs a 90mm diameter hole in the bottom of the mixer.
- Electrical characteristics: the probe is wired to the ITH3 deported casing with a cable supplied by the company HYDROSTOP. Its length is 5m; it is composed of 4 wires distributed as follows :
  Blue wire: Measure
  Black wire : 0 V signal

IMPORTANT: The White and Brown wires are not used and should not therefore be connected to the deported casing.

6 - ELECTRICAL FEATURES

ITH3 deported casing

- Mechanical characteristics: It is a plastic box that can be assembled outside (IP55). It should be set as close as possible to the probe. It is mounted by welding on the mixer.
- Electrical characteristics: One H3 plasticity probe can be connected on the ITH3 with the abovementioned cable. It is powered via the "shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

HWB deported casing

- Mechanical characteristics: it is a plastic box which should be assembled in a power panel. It should be set on a "DIN Rail" and as close as possible to the three-phase network that powered the mixer.
- Electrical characteristics: one CT (Current transformer) is connected to the HWB. It is powered via the "shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

HBSA Interface casing

This casing is only present if the outputs are analogical (0-10V or 4-20mA). If this is not the case, it is replaced by the Modbus / TCP present on the H4-I and which does not require deported casing.

- Mechanical characteristics: it is a plastic box which should be assembled in a power panel. It should be set on a "DIN Rail" and as close as possible to the inputs of the automaton.
- Electrical characteristics: It is powered via the ""shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

The HBSA has inputs and outputs which are:

- 8 outputs 0-10 V / 4-20 mA / 0-20 mA These outputs are used to return the image of the measure to the automationIt is important to note that the 4-20 mA mA/0-20, is rarely used, and is available only if its presence is specified in the order.
- 8 dynamic inputs. These inputs are used to measure moisture in dynamic mode, which means that we take the measure only at the opening of the bin gate. A dry contact shall be connected between a terminal of the box and the common(15 V)
- HBSA inputs and outputs must be connected with a wire of 0.50mm^2.
- The HBSA has a 160mA delay fuse.

HBSR Interface casing

This casing is only present if the outputs are analogical (0-10V or 4-20mA) and you order it to connect threshold. If you want threshold and you have digital outputs, it is replaced by the Modbus / TCP present on the H4-I and which does not require deported casing.

- Mechanical characteristics: it is a plastic box which should be assembled in a power panel. It should be set on a "DIN Rail" and as close as possible to the inputs of the automaton.
- Electrical characteristics: It is powered via the "shielded double twisted pair" cable (0.75 mm^2).

The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

This box has 16 outputs that are:

- 16 relay outputs. These outputs are used to send the image of a threshold set on one of the measures of the system. The connection of these outputs is achieved by connecting a common from the automaton on one of the two contact pins. The threshold level will be present on the second. These outputs must be connected with wires of 0.50 mm^2.
- The HBSR has a 250mA delay fuse.

H4-I display

- Mechanical characteristics: The H4-I display is a plastic box that can be embedded into a console owing to its metallic routing.

The connection Modbus / TCP is carried out through an RJ-45 cable.

- Electrical characteristics: It is powered via the "shielded double twisted pair" cable (0.75 mm2). The input power is 24 volts AC supplied by the two wires (green and yellow). The digital connection is maintained by the BROWN (D1) wire and the WHITE (D0) wire.

6 - ELECTRICAL FEATURES

Power consumption of the system:

Probe MO2:
Inominal : 125mA - Valim : 12Vcc

BDH4 deported casing:
Imax : 580mA - Valim : 24Volts AC

BDCIM-Multi deported casing:
Imax : 700mA - Valim : 24Volts AC

BDCIM-Mono deported casing:
Imax : 125mA - Valim : 24Volts AC

BDTEMP deported casing:
Imax : 270mA - Valim : 24Volts AC

BDEC deported casing:
Imax : 100mA - Valim : 24Volts alternatif

HBSA interface casing:
Inominal : 160mA - Valim : 24Volts AC

HBSR interface casing:
Inominal : 250mA - Valim : 24Volts AC

H4-I display:
Inominal : 340mA - Valim : 24Volts AC

Maximum cable length:

MO2 probe cable:
length supplied: 10 m

H3 probe cable: length supplied: 10 m

Flint cable: length supplied: 15 m

CAN bus cable:
Maximum length: 300 m

Input/output HBSA cable:
Maximum length: 5 m

Electrical NOTE:
Several system components include electrical hazards. These are indicated by the following marking:

H4-I display:
The H4-I display has a lithium battery. There is a risk of explosion if battery is replaced by a battery of wrong type. This type is CR1620. The batteries must be recycled appropriately.

Transformer
The transformer is powered with 230V AC and can only be handled by an authorized person.

7 - WIRING RULES

To ensure that the system functions correctly, it is essential that certain wiring rules are specified and respected.

Type of wire used

The digital link maintained between the various casings should be achieved using a "shielded double twisted pair" cable with a cross-section of 0.75 mm^2.

The cable maintaining the link between the MO2 probes and the BDH4 deported casing is a specific cable supplied by Hydrostop.

The cable maintaining the link between the Flint junction boxes and the deported casing is a specific cable supplied by Hydrostop.

The cable maintaining the link between the H3 probes and the ITH3 deported casing is a specific cable supplied by Hydrostop.

As far as possible, the cable maintaining the digital link must be separated from the power cables (motor lead type).

The cable ensuring the digital connection between the probe and the deported casing must not under any circumstances be tightened with the power cables as this may distort the measurement.

Connection

It is important not to twist the probe connection cable as this will interfere with the measurement.

Length of cables

The length of the supplied probe cables is 10 m.

The digital connecting cable is supplied ex-stock, with a maximum length of 300 m.

Length of cables

The length of the supplied probe cables is 10 m.

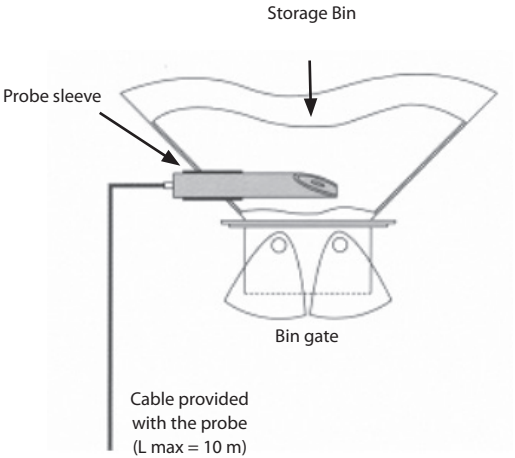
The digital connecting cable is supplied ex-stock, with a maximum length of 300 m.

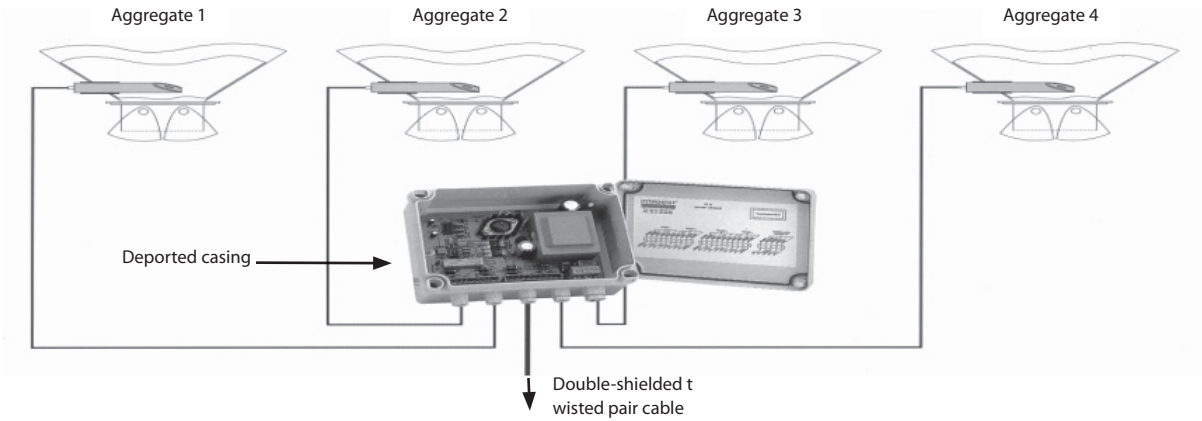
CAN bus

The CAN bus is a parallel bus. This means that each unit can be directly connected to two other casings on the HYDROSTOP network. In addition, the boxes at each end should be marked as such. For this, each case includes a jumper near the connector 5 points where the CAN bus is connected. It should be in place on the boxes at each ends of the CAN bus.

8 - PROBES – INSTALLATION PRECAUTIONS

8.1. MO2 probe





1 / Removing the probe is essential before welding the sleeve to the bin.

2 / Disconnect the probe in case of welding nearby.

3 / Set the measurement part of the probe in the middle of the flow of aggregate. The face of this part must be able tilted about 45 degrees from vertical, to facilitate the flow and thus avoid a permanent deposit of the aggregate on the probe which would distort the measurement.

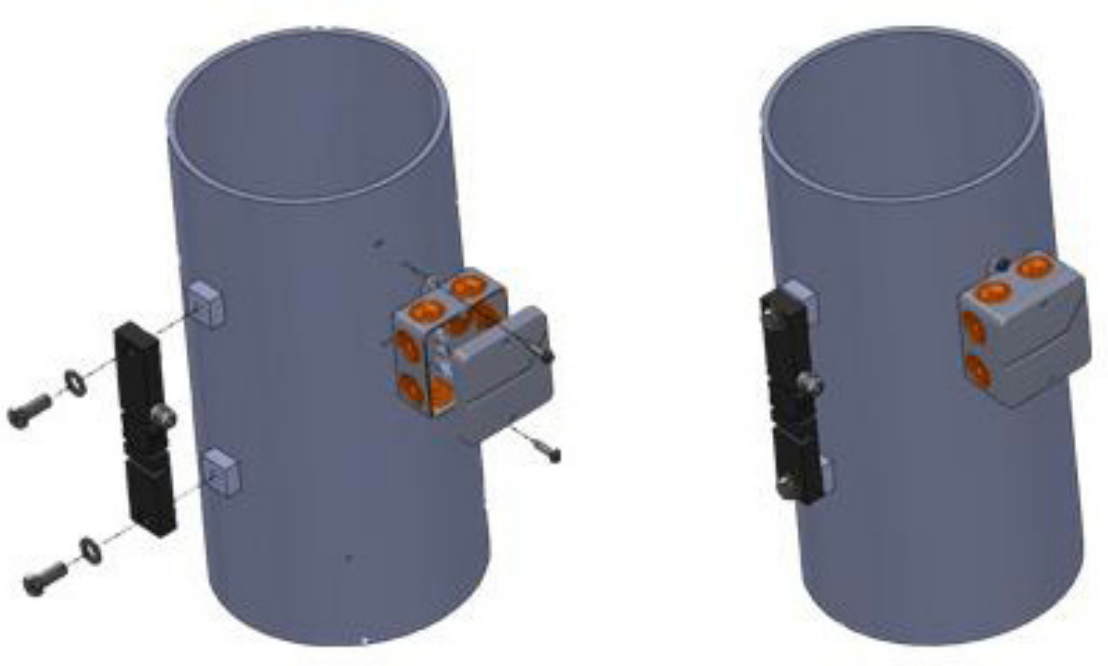
4 /
- The cable between the probe and the deported casing should be as short as possible. For this, the deported casing should be centered over bins.
- The probe cable must be as removed as possible from power cables to reduce electromagnetic induction, which can disturb the measurement (the probe cables must be fed through an independent pipe).
- The probe cable is 10 meters long. It is imperative to cut the length not used so that the cable is as short as possible. (Do not coil the rest of the cable).

5 / The maximum length between the deported casing (near the bins) and the display (at the control panel) is 300 meters. The cable used for this connection must necessarily be a shielded double twisted pair. (2 x 2 x 0.75 mm^2).

8 - PROBES – INSTALLATION PRECAUTIONS

8.2. Flint

1/Weld the studs using the template provided for this purpose. Check that the faces of the two blocks are parallel and on the same plane. The axle linking the blocks must be the same as the silo. It does not have to be vertical. For the positionning of the flint, please contact the company HYDROSTOP to be advised. Improper positionning can cause malfunction of the measurement.



2 / Disconnect the flint from the BDCIM before making a weld on the silo.

3 / Place the flint with the two studs. Loosely screw the 2 3/8" nuts, the flint should always have a nimble in that position.

Tighten the nuts jointly operated by a tightening of about 1/8th of a turn alternately.

The rated torque is 54Nm tightening nut on each, it is imperative to use a torque wrench to get it.

4 / The maximum length between the deported casing (near the silos) and the display (at the control panel) is 300 meters. The cable used for this connection must necessarily be a "shielded double twisted pair". (2 x 2 x 0.75 mm2).

8 - PROBES – INSTALLATION PRECAUTIONS

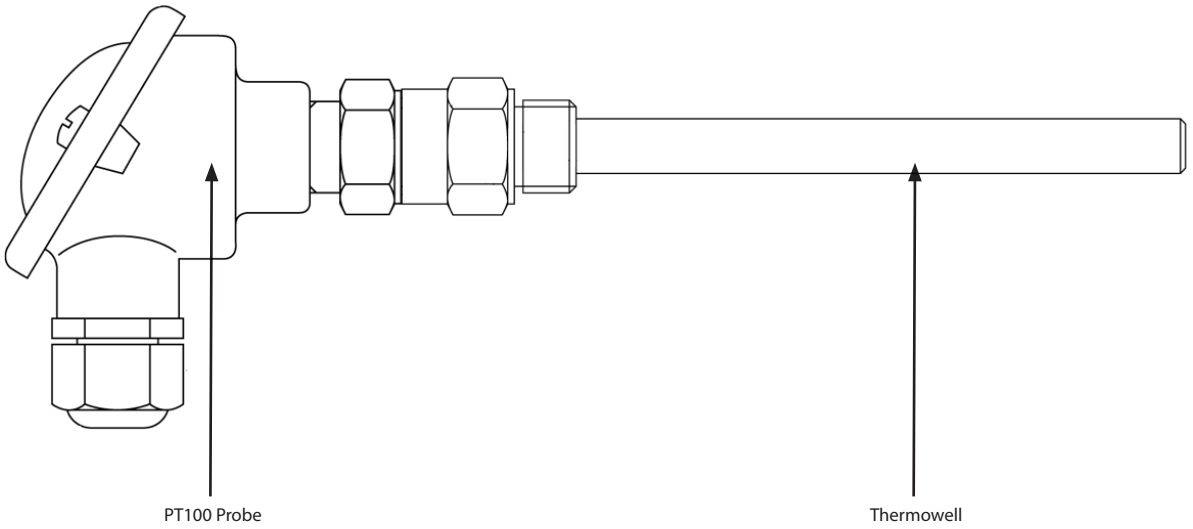
8.3. Temperature probe

1 / Weld the mounting ring (½ "gas) on the silo and then tighten the thermowell on the ring. The thermowell does not have to be moved then because the probe itself is interchangeable without unscrewing.

2 / Remove the probe before any welding operation nearby.

3 / The cable between the probe and a BDTEMP deported casing should be as short as possible. For this, the deported casing should be centered over silos.

4 / The maximum length between the deported casing (near the silos) and the display (at the control panel) is 300 meters. The cable used for this connection must necessarily be a shielded double twisted pair. (2 x 2 x 0.75 mm^2).



8.4. Turbidity probe

1 / Attach the probe at the end of a stick so as it is always immersed regardless the level of the tank. The probe must be positioned in a place where the liquid is agitated in order to measure a representative value.

2 / Check the fouling of the probe every month because it can cause a drift in the measurement.

3 / The cable between probe and power supply should not be shortened. This means you may need to make loops with it. This will not lead to significant interferences of the measure.

4 / The maximum length between the deported casing (near the recovery tank) and the display (at the control panel) is 300 meters. The cable used for this connection must necessarily be a shielded double twisted pair. (2 x 2 x 0.75 mm^2).

8 - PROBES – INSTALLATION PRECAUTIONS

8.5. H3 probe

1/ Disconnect the probe before making a weld on the mixer. 2/ The active part of the probe is extremely weak. Under any circumstances, **it should undergo direct impact of fear of being damaged and deteriorates the measure.**

3 / The maximum length between the deported casing (near the mixer) and the indicator (at the control panel) is 300 meters. The cable used for this connection must necessarily be a shielded double twisted pair. (2 x 2 x 0.75 mm^2).

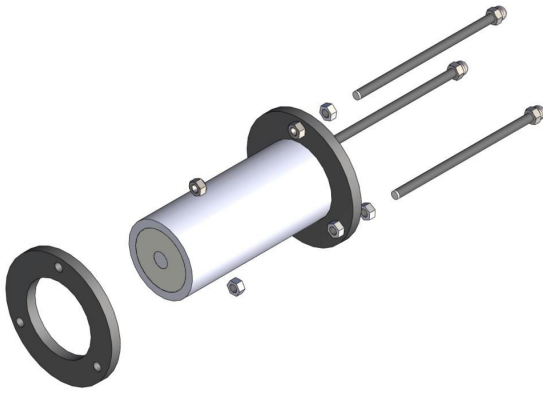
8.6. Current transformer (CT)

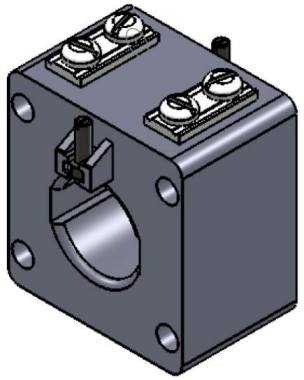
1/ The CT should be installed on phase one of your three-phase circuit so that the power meter can work. Also, for security reasons, it must be located after the switch.

2/ You must be careful on the direction of your CT. If it is installed in the wrong one, the power meter will not work.

3/ The caliber of your CT depends on the power consumption of your mixer. An improperly sized CT can cause saturation or a loss of measurement accuracy, or even destruction of the probe for an undersized one.

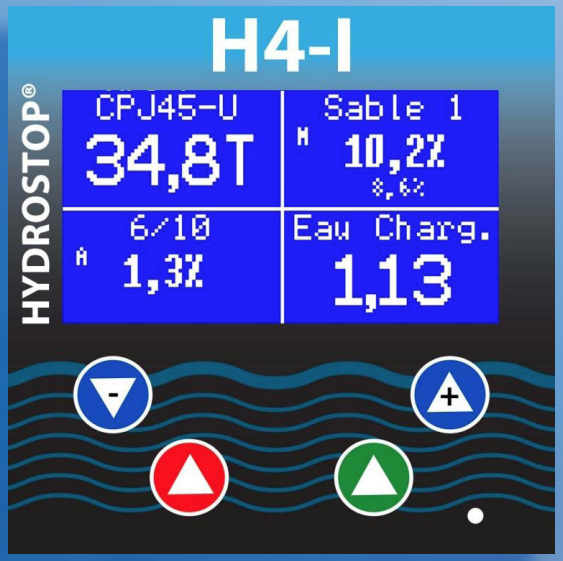
The company HYDROSTOP can advise you for the caliber of your CT. Don't hesitate to contact them.





RAW MATERIALS
MANAGEMENT SYSTEM

H 4-I



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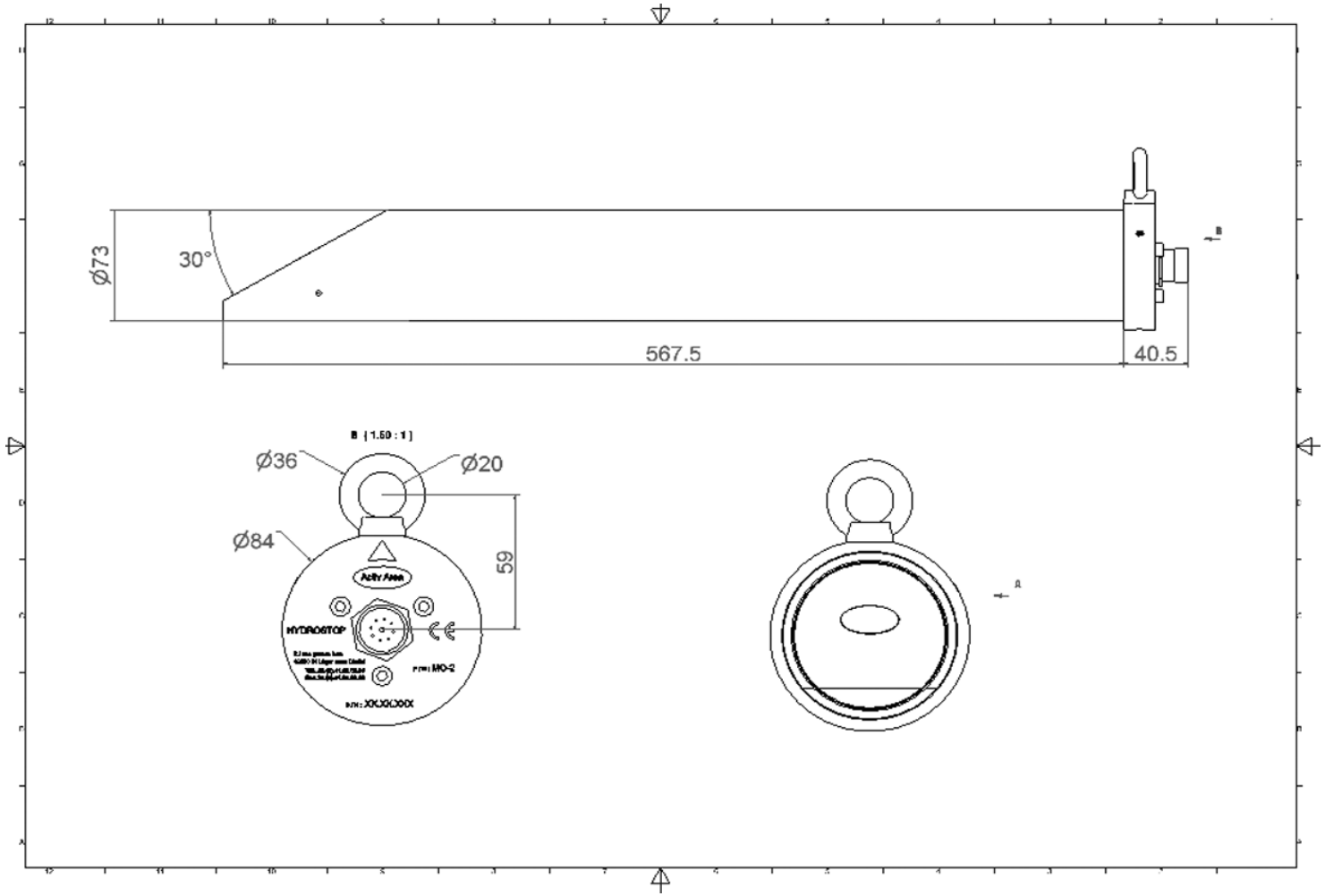
Probe Presentation

APPENDIX A

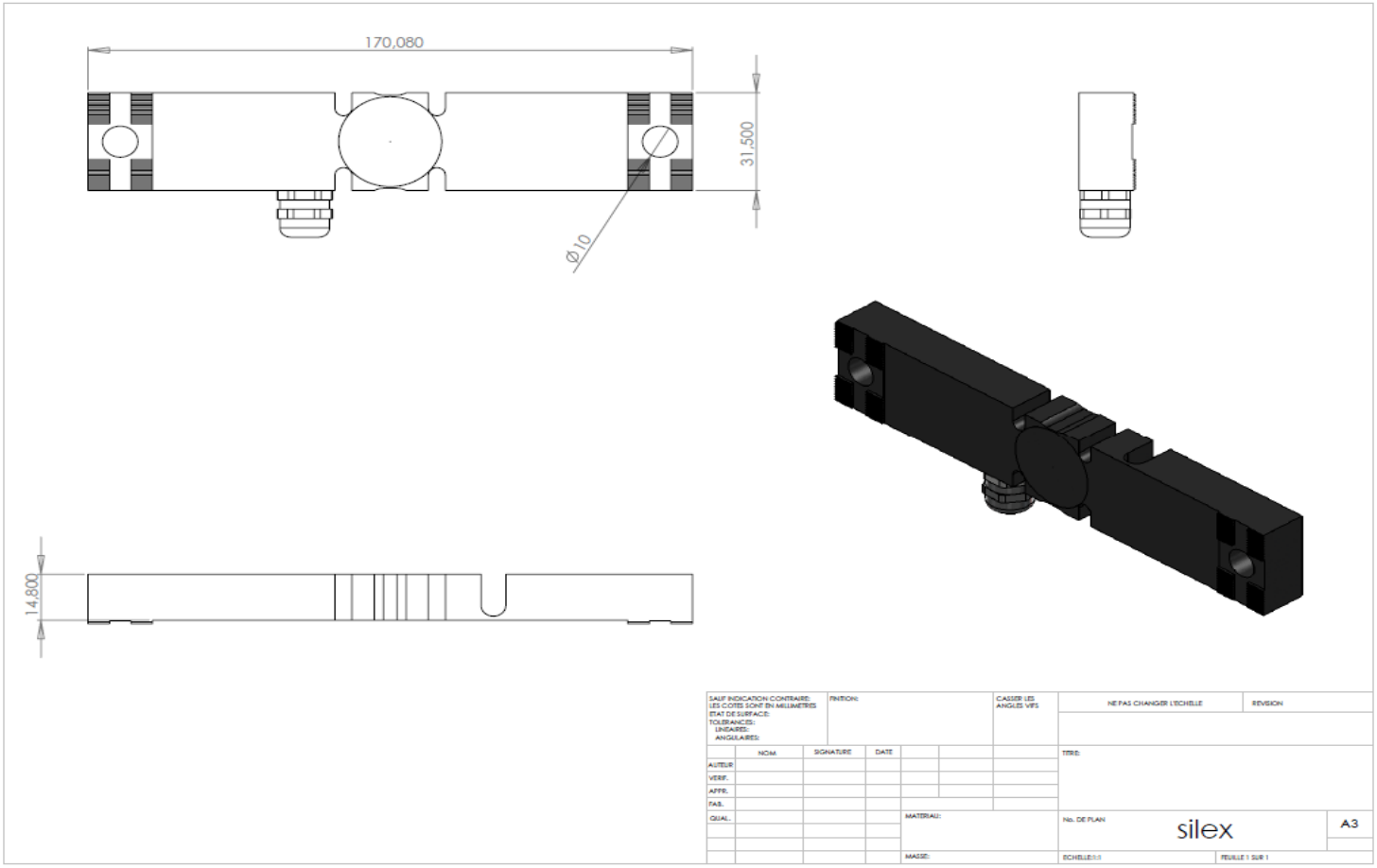
APPENDIX A - PROBE PRESENTATION

A.1. MO2 Probe



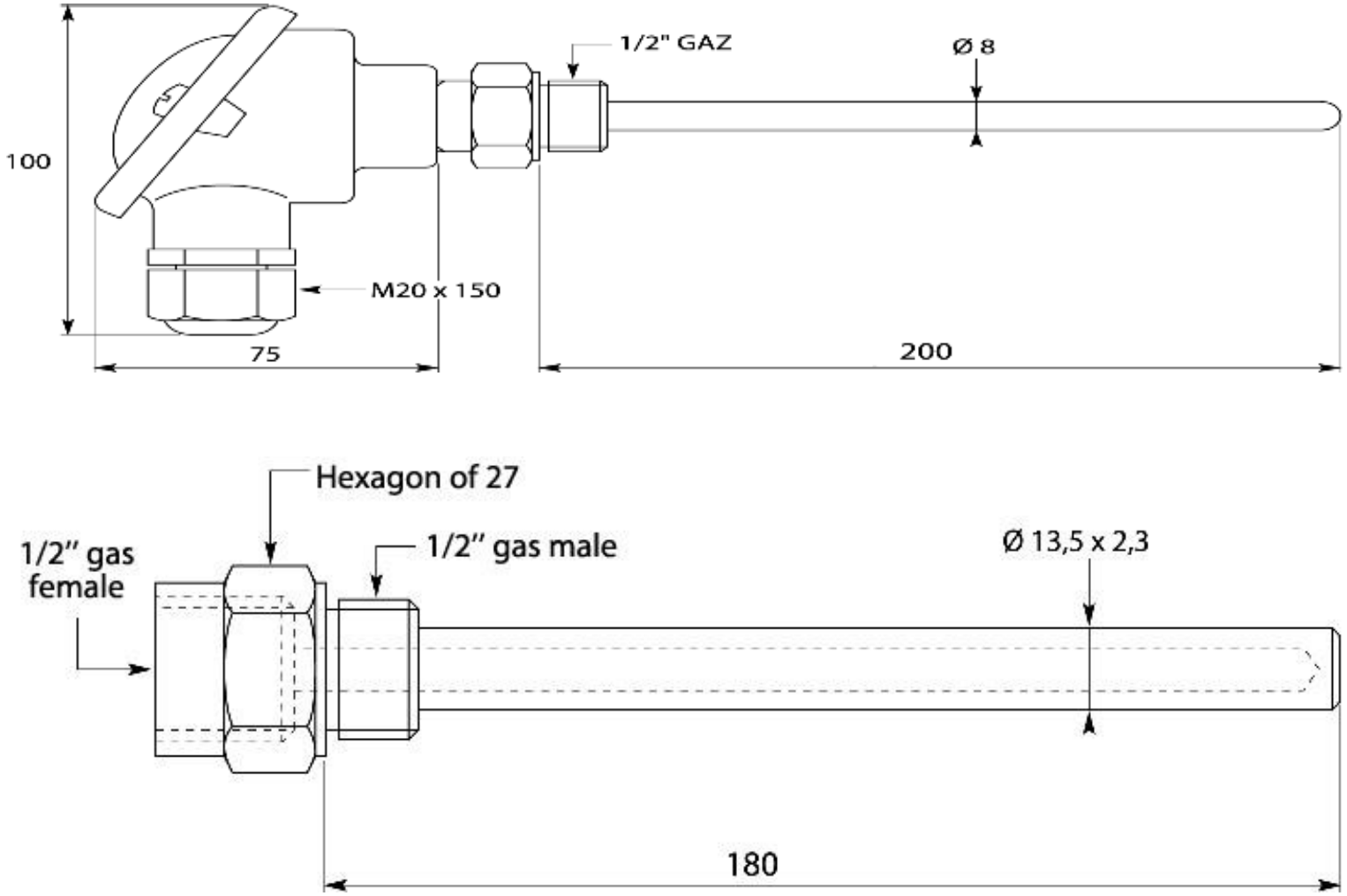
APPENDIX A - PROBE PRESENTATION

A.2. Flint



APPENDIX A - PROBE PRESENTATION

A.3. Temperature probe

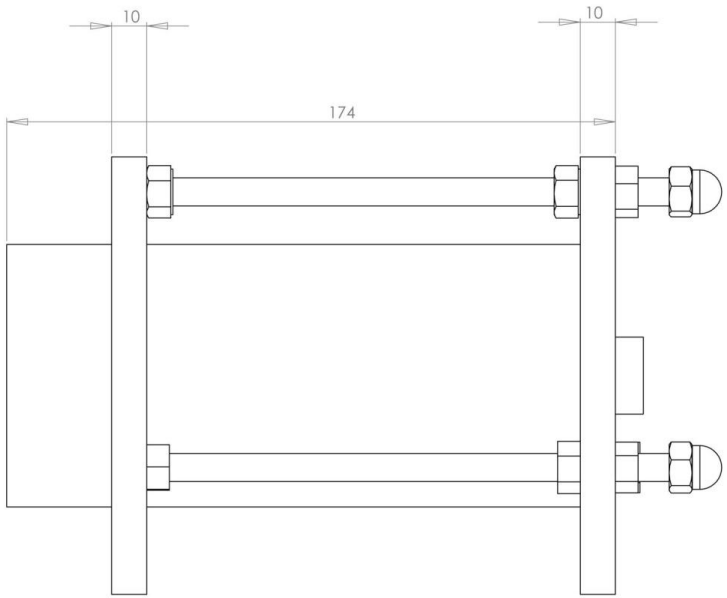


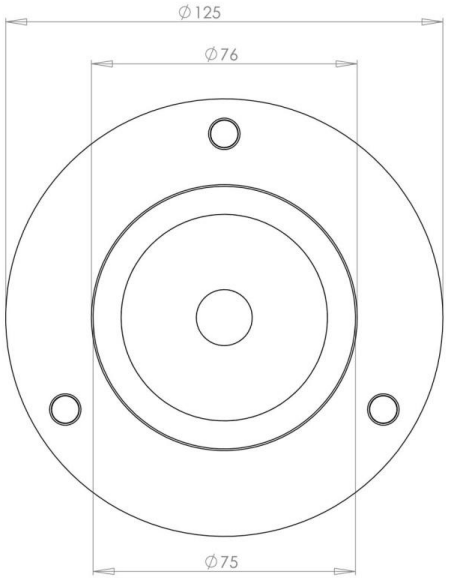
APPENDIX A - PROBE PRESENTATION

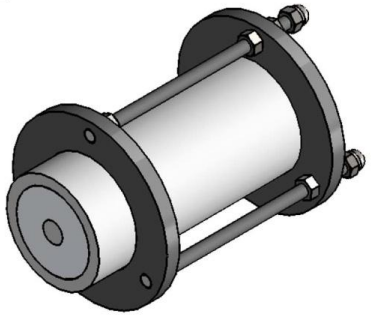
A.4. Turbidity probe

APPENDIX A - PROBE PRESENTATION

A.5. H3 plasticity probe

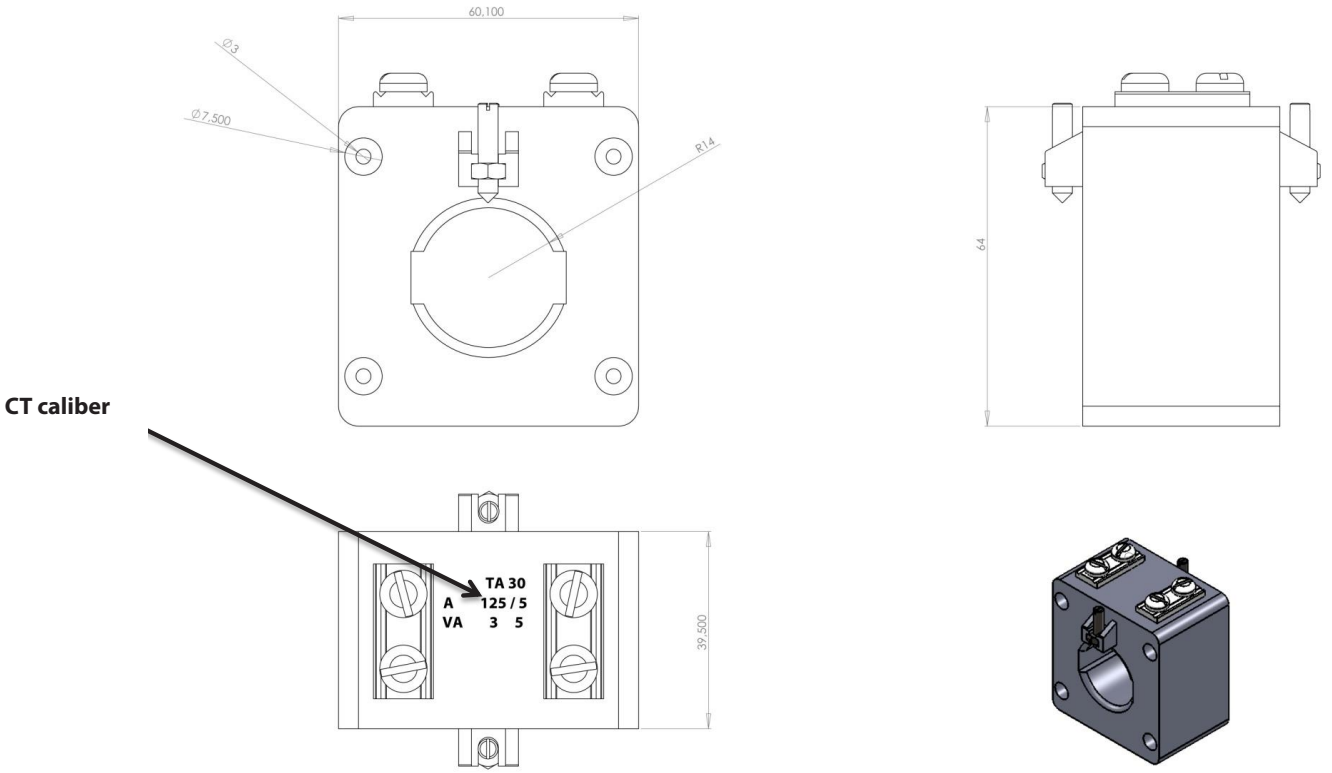






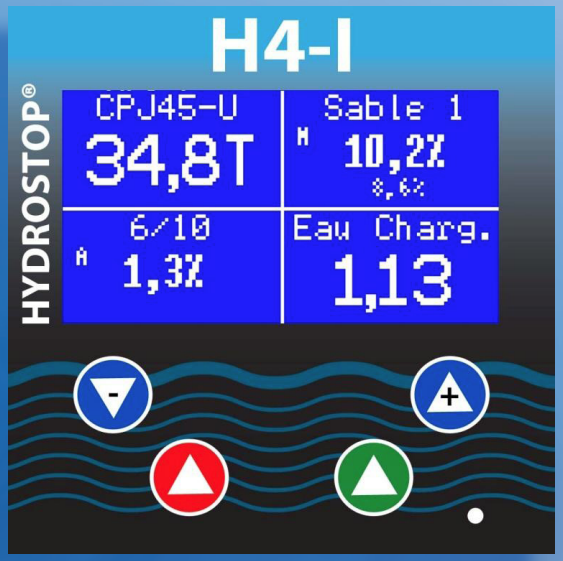
APPENDIX A - PROBE PRESENTATION

A.6. Current transformer (CT)



RAW MATERIALS
MANAGEMENT SYSTEM

H 4-I



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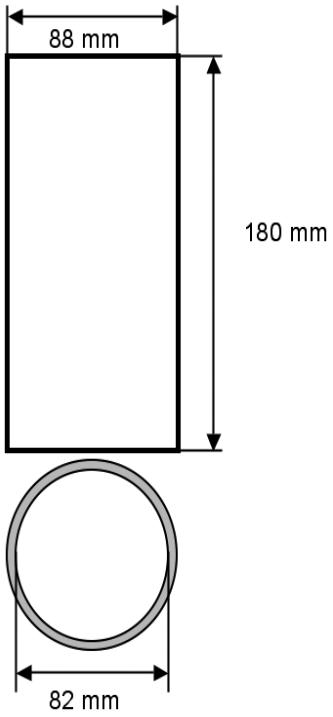
System size

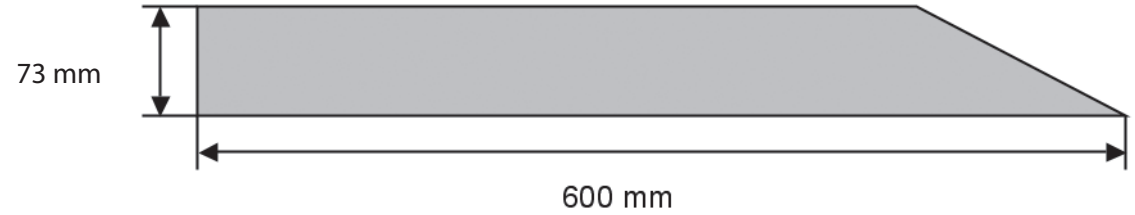
APPENDIX B

APPENDIX B - SYSTEM SIZE

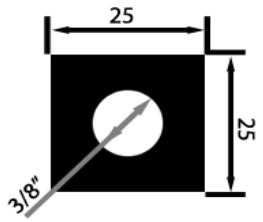
a. MO2 probe sleeve



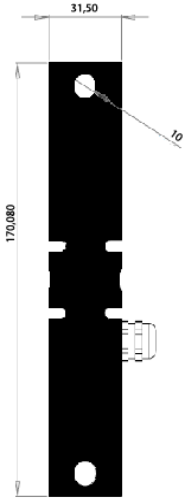
b. MO2 probe



c. Flint studs



d. Flint



e. H4-I Display

Dimensions : Width = 96 mm
Height = 96 mm
Depht = 72 mm + connector

Cutting dimensions in the console :
Width : 92 mm
Height : 92 mm

f. BDH4, BDCIM, BDTEMP deported casing

Dimensions : Width = 190 mm
Height = 170 mm
Depht = 100 mm

g. BDCIM-Mono, BDEC deported casing

Dimensions : Width = 160 mm
Height = 90 mm
Depht = 60 mm

h- ITH3 deported casing

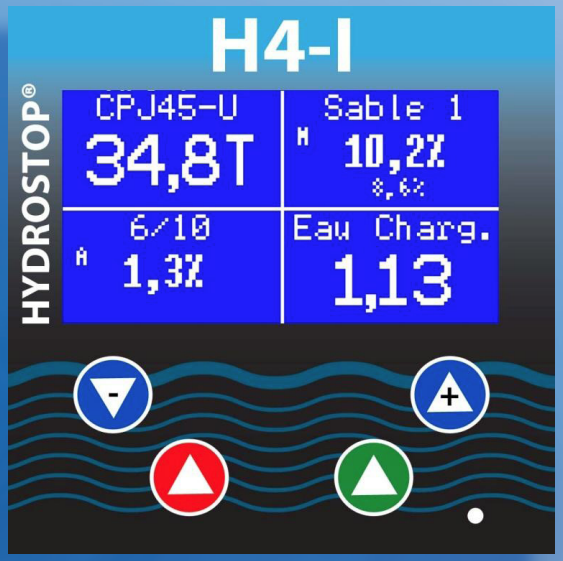
Dimensions : Width = 120 mm
Height = 80 mm
Depht = 60 mm

i- HBSA, HBSR, HWB, Transformer

Dimensions : Width = 160 mm
Height = 90 mm
Depht = 60 mm

RAW MATERIALS
MANAGEMENT SYSTEM

H 4-I



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Implementation of the Modbus/TCP

APPENDIX C

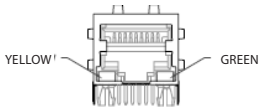
APPENDIX C - IMPLEMENTATION OF THE MODBUS/TCP

Thanks to the Modbus/TCP, the H4-I makes quickly available all its measures to the automaton. This allows to save some electronical casings and to make easier the physical connection between the HYDROSTOP system and the automaton.

C.1. MODBUS/TCP protocol integration

C.1.1. Physical connection

The Modbus / TCP proposed by the H4-I display connects directly to the Ethernet network of the concrete plant. It needs to connect a network cable through the H4-I to a free slot on a HUB. If the IP address of the H4-I has already been set, it indicates that it is physically connected by lighting the green LED on the RJ-45 connector.

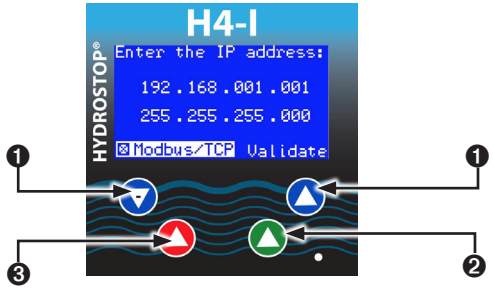


C.1.2. IP address settings

To enable the communication between the H4-I and the automaton, you need to set the IP address of the display. HYDROSTOP devices does not support DHCP; so you have to set this IP address.
To do this, you must go to the main menu of the device and enter the "Administrator" code.

We must then select the following option:

IP address settings



❶ Shift the selection or modify a value if it is in « active » mode.

❷ Set the selection on « active » mode (in this mode the selection will flash and the value can be modified with the F1 and F2) or, otherwise, validate the change.
If the selection is on "Modbus/TCP", the activation of Modbus/TCP measure changes state. If the selection is on "validate", the changes are saved.

❸ If a value is set on « active » mode, this mode is exited and the value returns to its initial state. Otherwise, it exits the menu without saving changes.

Once validated the IP address, the two LEDs on the back of the display should flash. This may take several seconds as the display initiates the communication. If the LEDs do not blink, check the physical connections and try again to enter the IP address. If this still does not work, contact the company HYDROSTOP.

C.1.3. Protocol settings

The next step is to open a socket between the display and the automaton. It must be open on port 502.
This number corresponds to the one assigned by the standard Modbus / TCP protocol and must be strictly respected to operate. Once opened, you can read the information provided by the H4-I.
To do this, you must use frames of Modbus-TCP.
Function codes recognized by the H4-I are:

Code	Name	Number of log books read simultaneously	Comments
3	Reading of several words	125	Allows to read several consecutive words
4	Reading of input words	125	
6	Writing of one word	1	Allows to write one word
16	Writing of several words	123	Allows to write several consecutive words

Reading and writing on the H4-I are possible from the address 0x0000.

APPENDIX C - IMPLEMENTATION OF THE MODBUS/TCP

C.2. Data exchange between the H4-I and the automaton

C.2.1. Data made available by H4-I

The H4-I makes available 2 data words to the automaton. These are classified as follows:

Word 0 :
- MSB: Data from the 1st Probe
- LSB : Data from the 2nd Probe

Word 1 :
- MSB: Data from the 3rd Probe
- LSB: Data from the 4th Probe

Word 2 :
- LSB: Threshold image bits

CAUTION:
As with analogical outputs, a measure of plasticity require two bytes to transFER all its information (Temperature + Plasticity). They will shift so the other measures. Example: If a measure of plasticity is in the first box, the measurement of moisture placed in box 2 will be available on the MSB of the Word 1.

C.2.2. Data sent by the automaton

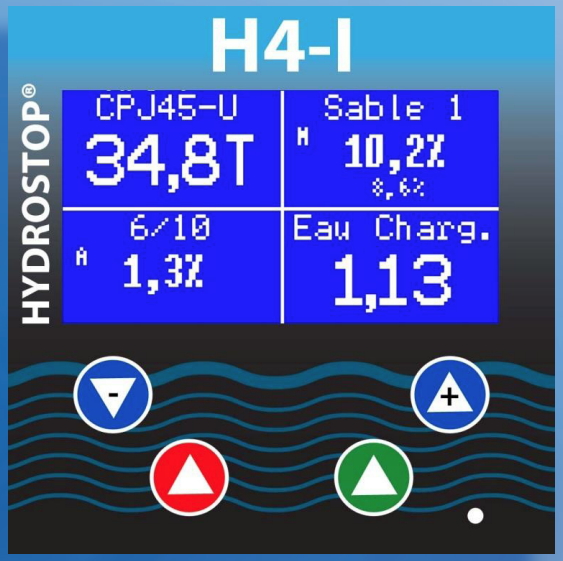
Due to the absence of the system HBSA when the system works with Modbus / TCP, dynamic inputs must be sent by the automaton via the Modbus / TCP. For this, it must write to the address 0x0000 in the LSB, the bits corresponding to each of the boxes:

Word 0 :
- MSB : Unused
- LSB : Dynamic inputs
  - bit 0: 1st Probe
  - bit 1: 2nd Probe
  - bit 2: 3rd Probe
  - bit 3: 4th Probe

CAUTION:
As with analog outputs, a measure of plasticity will use 2 inputs bits (temperature + plasticity). This will shift so the other measures. Example: If a measure of plasticity is in the first box, the measurement of moisture placed in box 2 will use bit 2 as an image of its bin gate.

RAW MATERIALS
MANAGEMENT SYSTEM

H 4-I



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Installation manual

APPENDIX D

APPENDIX D - INSTALLATION MANUAL

Installing this system requires to perform manipulations in the control panel of the concrete plant. It should therefore be performed by a person authorized to work in this environment. All electrical connections must be carried off. Make sure, that the transformer has already been wired, and that the circuit breaker or fuse attached to it have been cut.
If the installer does not respect the precautions detailed in this guide, safety is no longer insured and the system functionning is not guaranteed.

D.1. Casings installation

D.1.1. Display installation

The display H4-I is recessed. It is sufficient to provide a cutting 92 x 92 mm in the desk in order to insert it. This cut must be accurate because the framework dimensions for its maintenance are only 96 x 96 mm. In order to prevent movement after installation, a kit screw is installed so as to have the casing tight against the wall.
The dimensions are as follows:

Dimension of the frame: 96x96
Cutting the panel: 92x92

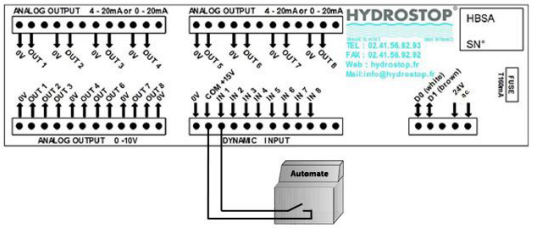
The required electrical connection is 5 pts connector including power and CAN bus. Verify there is no voltage before realizing the connection to avoid damaging unit. We recommend connecting the display to one end of the bus. If not possible and you need to go back to other casings, be sure to set the switch on the back of the unit to 0 to disable the plug end of line.

The connection of the Modbus / TCP is achieved by pulling a cable between the RJ-45 connector of the display and a free slot of a HUB connected to the network of the plant. To set up the Modbus / TCP, see the relevant Annex. The RJ-45 is not free on every display.
The safety pictogram is present because the display includes a battery CR1620 presenting a risk of explosion. It serves to the operation of the RTC. If it is faulty, contact the company for HYDROSTOP to obtain a new display. HYDROSTOP company will not support the damage on the product due to the replacement of this battery by yours.

D.1.2. HBSA installation

It is recommended to position the HBSA close to the automaton. The box is specifically designed to be installed on a DIN rail.
If your system has got several HBSA, please to check that every login fixed by the thumbwheel is different for each. It is easier to numerate them in growing mode, from 0.
To connect the outputs 0-10V on your automaton, you must use 0.50 mm ^{2} wires. Each output of the casing HBSA match an entry in your automaton. In addition, you must connect the 0V of your HBSA to the 0V of your automaton.

Before connecting the outputs 0-20mA or 4-20mA, make sure this has been ordered from the company HYDROSTOP because if it is not the case, they will not work. These outputs operating on the principle of a current loop, you will connect the two 0.50 mm ^{2} wires corresponding to each output to the corresponding inputs of your automaton.
The dynamic inputs are been activated when they have a common (+15 VDC to +24 VDC) to their terminal. Their connection is realized by connecting their input on a dry contact output of the automaton and plugging in a common on the other terminal of this contact. This may be the one proposed by the HBSA or one of those in automaton.

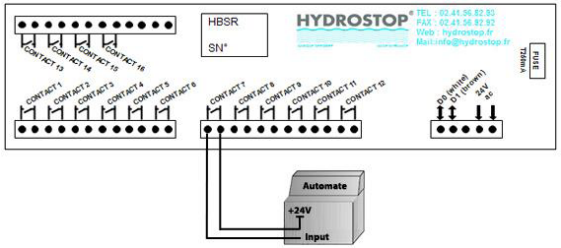


Before you connect the five points including power and CAN bus, make sure that there is no tension on the green and yellow wires not to damage the casings due to improper handling. If the HBSA is at the end of the CAN bus, place the jumper next to the connector 5 points.

APPENDIX D - INSTALLATION MANUAL

D.1.3. HBSR installation

It is recommended to set the HBSA close to the automaton. The casing is specifically designed to be installed on a DIN rail. You can only put it, but it can suffer from eventual vibrations and in that case the functionning is not guaranteed.
To connect each threshold, you must bring a common (24 VDC) from the automaton on one of the terminals and connect the other terminal at an input of the automaton. An output logic '1 'means that the threshold is set.



Before you connect the five points including power and CAN bus, make sure that there is no tension on the green and yellow wires not to damage the casings due to improper handling. If the HBSR is at the end of the CAN bus, place the jumper next to the connector 5 points.

D.1.4. Transformer installation

It is recommended to fix the transformer near the display or HBSR and HBSA casings. The casing is specifically designed for installation on a DIN rail which ensures its stability.
The transformer needs to bring a 230V on the primary. It must be protected by installing two fuse 1A 2P + 2fusibles am or 2 2P 1A D curve circuit breakers which are not provided. The secondary must be connected to one of the casing of the network which will generally be the display H4-I, or a HBSA or HBSR. It is necessary to connect the two terminals on the same wires that power the system, the green and yellow wires of the "double twisted pair" cable. It is recommended to choose a casing at the end of the CAN bus because only a single cable will be connected to the connector 5 points and it will be easier to connect these two wires. The secondary must be protected by a time delay 1P + N 4A fuse or circuit breaker 1P + N 4A C curve not included. HYDROSTOP company can provide references of protection equipment.
In the event of electrical problems on installation, changes must be performed after isolating the transformer from the main power by cutting the circuit breaker or fuse. This operation can only be performed by a person authorized to work in the power panel.

CAUTION:
If the transformer is installed before the rest of the system, it is recommended not to connect the 230 V or to cut the coverage until the end of the installation. This will avoid any risk of damage to equipment.

D.2. Moisture probe installation

D.2.1. Mechanical installation

The accuracy of moisture measurement depends on the installation quality. To improve it, please follow perfectly the notes hereafter. Please contact the company HYDROSTOP to have additional information if you hesitate when installing.

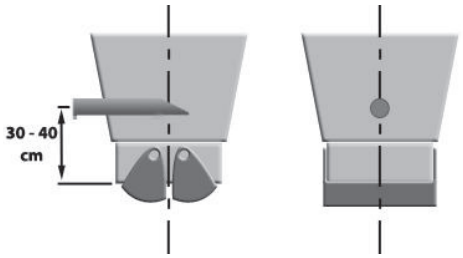
2.1.1. Positionning of the MO2 probes on a bin

The positionning of the probes is the most important part of the installation. If they are not installed in the correct position, it can forbid good measurements.
To avoid this, here are some rules which must be respected so that the system can work perfectly. If you have any doubts about the probe fixation, contact the company HYDROSTOP to have additional information.

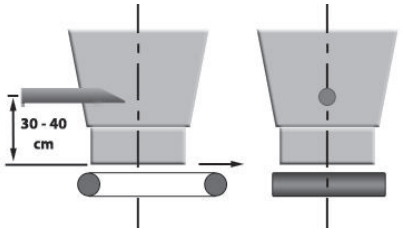
- The probe must be absolutely horizontal. Fixing the sleeve on the bin needs to be done as carefully as possible.
- The probe should be positioned approximately 30-40 cm above the bin gate or the extractor
- The active face should be in the middle of the bin. However, if a reinforcement is located just above the probe and forbids the flow of the aggregate on it, please to shift it so the flow pass over it when using the box
- In the case of an extractor, the probe must be placed on the opposite side of the ouput a third from the edge of the bin.

APPENDIX D - INSTALLATION MANUAL

Fixation of the probe on a bin with gates



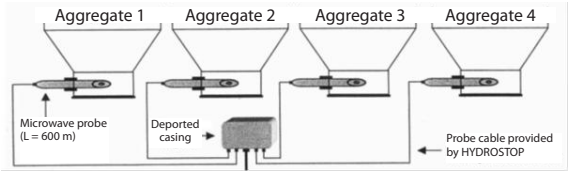
Positionning of the probe on a bin with extractor



D.2.1.2. Probes installation

Once the positionning of the probe is validated, you can install them mechanically. Start by drilling the bin in order to position the sleeve horizontally. The sleeve measuring 88mm diameter, the hole must measure at least 90mm.The walls are generally not vertical; the hole would not necessarily be round in order to allow proper positionning of the sleeve.

Once it is done, place the sleeve and weld it so as to be horizontal and the probe tip in the middle of the bin. Check that the probe has been removed from the sleeve before welding as this may damage it. Benefit from having the equipment near the bin to weld the deported casing on them. It must be positioned to minimize cable length of probes. It is usually in the middle of all the bins.



Then place the probe in the sleeve. Tuck it until the active face is positioned in the middle of the bin. To avoid measuring dead stocks, the probe should be tilted 45 degrees to facilitate the flow over the active face. A benchmark is available at the rear of the probe to indicate the position of the active face. Then tighten the 6 screws that you will block with the following cons nuts. Finally, the chain must be attached between the ring of the probe and the sleeve.

D.2.2. Electrical installation

After the mechanical installation is completed, you can connect the probes to their deported casing. It should not be turned on during this operation.

CAUTION: If the casing is not yet weld, disconnect all the connections prior to soldering as you may damage the probes.

Connect the three cable wires of each probe as described in chapter 5.3. Start with the "probe 1" location in the BDH4 as it corresponds to the first box on the display. If you have only two probes and you plug them in slots 3 and 4 of the casing they will not be taken into account by the display. The wires to connect to each probe are:

Green : 12V signal
Black : 0V Signal
White : Output of the probe

Once it is done, you can power the BDH4. To do so, wire on the connector 5 points right on the diagram (Section 5.3) the 24V AC and the CAN bus. Then turn the power on by plugging the transformer to verify the installation.

APPENDIX D - INSTALLATION MANUAL

D.2.3. System checking

After completing the entire installation, you must calibrate the system so that it can function properly. However, to verify if it works, you need to check on the H4-I the following:

- First, make sure that the communication with the deported casings works. For this, the relevant box (s) must not indicate the corresponding failure to loss of communication with the deported casing (see Chapter 4.4.).
- Then go to the main menu of the display to activate the "voltmeter" option (see Section 3.1.b.) to check the voltage returned by the probe. This must be upper than 0.20 V. If not, check the connections of the probe on the BDH4 deported casing.

D.3. Silo weighing probe installation

D.3.1. Mechanical installation

The accuracy of silo weight measurement and its stability are largely related to the quality of the mechanical installation of the flint, on the feet of the silo. To improve it, please follow completely the following and feel free to contact HYDROSTOP to have additional information if you hesitate when installing.

D.3.1.1. Fixation of the flint on the feet of the silo

The fixation of the flint is the most important part of the installation. If they are not installed in the correct position, it can reduce the accuracy and up to prevent the good functionning of the system .

To avoid this, take a picture of the silo from several angles and send the photos to the company HYDROSTOP specifying the name of the plant and the orientation of pictures (North, East ...). The photos will be shipped back as soon as possible with the positionning of flints and showing you in which direction you must put them.

However, there are several rules that you must always follow:

- All the flints of the same silo must be located at the same level so the strength they undergo is equivalent.
- The axis of the flint must always be the same as the foot of the silo, so that the compression is always made in this axis. They should not always be positioned vertically.
- The flint must not face the North so as not to be exposed directly the sun; if it is impossible , you must put them on the North East
- The flints should never be at the same level as the silo reinforcements.

D.3.1.2. Flint installation

After the positioning of flint validated, you can install them mechanically.

Start by soldering using the template provided the two mounting studs of each probes by following these recommendations:

- Start by pointing the two blocks before finishing the weld to avoid creating parasitic stresses on one of them.
- Make sure the faces of two studs are on the same plane and at the same level otherwise the measure will be degraded by constraints on the flint. If this is not the case, desolder the pads to reposition them.

Then, screw flint as follows:

- Place the flint so that there is clearance between the mounting hole and screw in all directions to prevent stress during tightening.
- Tighten alternatively the two screws on each foot running 1 / 8 of a turn by 1 / 8 of a turn to prevent the tightening of one to create a twist when tightening of the second.
- Tighten with a torque wrench to a torque of 54 Nm per screw.

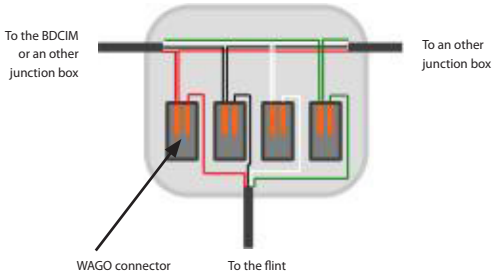
Get to fix the junction boxes of each flint on the foot thanks to the self-drilling screws provided and the deported casing by welding it near the silos.

D.3.2. Electrical installation

After the mechanical installation is completed, you can connect all the flint. Start by linking the BDCIM and junction box. Make sure the BDCIM is turned off before starting this step to avoid equipment damage or injury.
Correspond to different wires:

Red : +12V
Black : Ground
Green : Signal +
White : Signal -

The flint must be connected in parallel. It is recommended to connect the wires coming into and out to the junction box on the same terminal of the WAGO connector in order to replace them more easily. Shielding and ground wire can be wired on the same connector as they are with the same potential.



make the connection between the first junction box and BDCIM respecting the label on the BDCIM (see Chapter 5.4. Or 5.5. BDCIM depending on the type).

CAUTION: in case of the BDCIM-Mono, the BDCIM also serves as the first junction box and a Flint must be connected to the same terminals that the cable from the junction boxes.

Then connect the flint on their junction box. Start by connecting the Red and Black wires coming from the probe on the WAGO connectors to supply power to it. Then plug the 5pts connectors on BDCIM to supply power to power it and test the tension between the Green (+) and white (-) wires of each flint:

- The voltage must be of the order of mV.
- This voltage must not exceed 14 mV or less than-14mV. If so, the flint suffered too much stress. Untighten the flint without disconnecting it and re-check the tension, if it remains over 2 mV the probe is faulty. If it returns to zero, try to tighten the flint and recheck the tension. If the voltage is too high, check the mechanical installation of the studs as a parasite strain act on the flint
- Once these tensions are verified, unplug the power and connect the Green and White wires of each flinton the WAGO connector.

D.3.3. System checking

After completing the installation, you must calibrate so that it can work properly. However, to verify if it works, you need check on the H4-I the following

- First, make sure the communication with the deported casings works. For this, the relevant box (s) must not indicate the corresponding failure to loss of communication with the deported casing (see Chapter 4.4.).
- Then go to the main menu of the display to activate the "voltmeter" option (see Section 3.1.b.) to check the voltage returned by the probe. This must be equal to the voltage measured on the deported casing multiplied by 100. If not, check the connections of the probe on the BDCIM deported casing.

D.4. Temperature probe installation

D.4.1. Mechanical installation

The mechanical installation of temperature sensors is less critical than for other probes. Their fixation depends on the needs you have concerning the temperature of your cement. HYDROSTOP does not provide the mounting kit. The Hot Tapping required is ½" gas and may already be on your silos. Otherwise, it must be provided and installed by yourself.

D.4.1.1. Fixation of temperature probe on your silo

The fixation of sensors on the silo depends only on the area you want to measure.
The cable length between the temperature probe and the BDTEMP must be as short as possible to avoid a drift in measurement. Therefore place the deported casing in the middle of silos, to limit the distances.

D.4.1.2. Temperature probe installation

The temperature probes require a ½"gas hot tapping to be installed. HYDROSTOP company does not provide the necessary materials to complete it.
Once it is done, screw in the temperature sensor.
It consists of two parts: the sensor itself and the thermowell. So if you need to change the sensor, simply unscrew it, leaving the thermowell in place so the sealing of your silo is not affected.
The company HYDROSTOP can also provides PT100 only to measure the temperature in other areas of your plant.

APPENDIX D - INSTALLATION MANUAL

D.4.2. Electrical installation

After the mechanical installation is complete, you can connect the probes to their deported casing. It should not be powered during this operation.

CAUTION:
If the box is not yet fixed, disconnect all the connections prior to soldering as you may damage the probes.

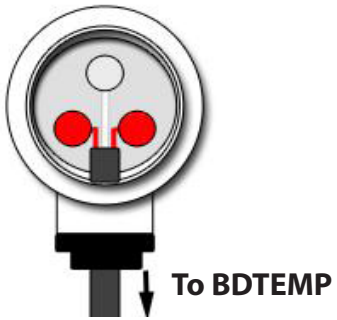
First connect 3 wires of a cable on the probe. To do this, unscrew the cover on the back of the probe to reach the three terminals. Pass the cable through the cable gland and connect a wire to each terminal.

CAUTION:
If you do not have the dedicated cable for PT-100 probes (3 or 4 red and white wires) keep in mind which color you plug on each terminals as it will be necessary to wire the deported casing.

Once this is completed, close the cover of the probe.

Then make the connection of the probe on the deported casing. If you have already completed the configuration of the temperature sensors on the display, make sure you connect each probe to its assigned input. If not, note where you plug each one in order to facilitate the setting of the probes in the H4-I.

The wires of each probe correspond to:



Red : Positive potential of the measure. It needs two wires to compensate drift due to the cable lenght.
White : Negative potential of the measure.

Once this is done, you can wire the BDTEMP. To do so, plug the connector 5 points right on the diagram (Chapter 5.7.) which connect the 24 V AC and the CAN bus. Then turn the power on by plugging the transformer to verify the installation.

D.4.3. System checking

After completing the installation, you can check the following points on H4-I:

- First, make sure the communication with the deported casings works. For this, the relevant box (s) must not indicate the corresponding failure to loss of communication with the deported casing (see Chapter 4.4.).
- If a temperature is displayed, check that it is consistent. Otherwise check the connection of the probe on the BDTEMP. The temperature probes require no calibration. Once they are installed, they must directly display the temperature.

APPENDIX D - INSTALLATION MANUAL

D.5. Turbidity probe installation

D.5.1. Mechanical installation

The accuracy of the turbidity measurement and its stability are largely related to the quality of the positionning of the probe. To improve them, please follow completely the following tips and feel free to contact HYDROSTOP to have additional information if you hesitate when installing.

D.5.1.1. Positionning of the turbidity probe

The positionning of the turbidity probe is essential for proper operation. This must be fixed at the end of a stick directly immersed in loaded water to measure. The depth of the probe must be the same as the pump inlet so that the concentration of fine dust is the same. In addition, it must be situated in a location where the liquid is stirred so that fine dust is not deposited at the bottom of the tank but remain in suspension.

D.5.1.2. Turbidity probe installation

The probe requires the attachment of the arm installed on the edge of the tank and the stick is attached on it. The power supply must be secured near the upper end of the arm so that the cable is not stretched and that we can remove the arm without disconnecting it.

D.5.2. Electrical installation

After the mechanical installation is complete, you can connect the probe to its power supply by tightening the cable on it. You should also connect the probe power supply to the deported casing. It should not be powered during this operation.

CAUTION:
If the box is not yet fixed, disconnect all the connections prior to soldering as you may damage the probe.

Connect to the casing with the two power wires and the two measure wires. Connect the other end of the cable to the probe power supply using the supplied M12 connector. The wiring of the connector is as below:

DIAGRAM COMING

Once this is done, you can wire the BDEC. To do so, plug the connector 5 points right on the diagram (Chapter 5. 8.) which connect the 24 V AC and the CAN bus. Then turn the power on by plugging the transformer to check the installation.

D.5.3. System checking

After completing the installation, you must calibrate so that it can work properly. However, to verify if it works, you need to check on the H4-I the following

- First, make sure the communication with deported casings works. For this, the relevant box (s) must not indicate the corresponding failure to loss of communication with the deported casing (see Chapter 4.4.).
- Then go to the main menu of the display to activate the "voltmeter" option (see Section 3.1.b.) to check the voltage returned by the probe. This must be greater than 1.00V. If not, check the connections of the probe on the BDCIM deported casing.

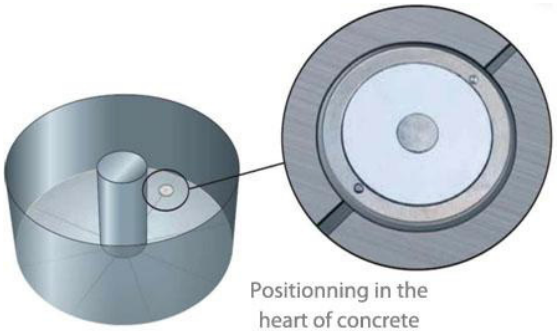
D.6. Plasticity probe installation

D.6.1. Mechanical installation

Depending on the Depending on the type of plasticity probe used in the system, the installation is completely different. For the microwave probe, the quality of measurement depends heavily on the positionning of the probe. The installation power meter is much easier For each type, HYDROSTOP provides non-standard parts required for installation.

H3 microwave probe

The probe microwave H3 should, if possible, be installed on the bottom of the mixer at approximately one third of its radius from the edge of the mixer. If it is not possible to install it on the bottom of the mixer, you can install it on the side but it must then be at a height where, regardless of the volume of concrete produced, the probe is completely covered. If you are in doubt about the position, please contact the company HYDROSTOP for advice.



Positionning in the heart of concrete

Once the location is chosen, drill the shield of the mixer to produce a hole of 90 mm in diameter. Then weld the mounting ring around the hole, making a cord around it. Attach the probe so that its active surface is level with the bottom of the mixer. Then tighten the nuts and bolts-cons.

Place the deported casing near the probe. You should place it directly on the mixer to make sure that the length of cable supplied with the probe is long enough. Make sure that no wiring has been made in the box before soldering to avoid damage to the equipment.

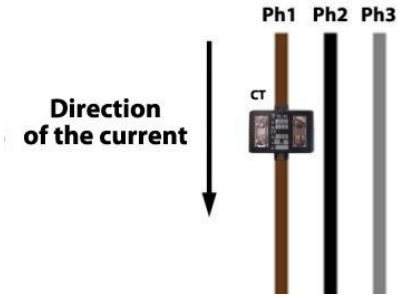
HWB power meter

The wattmeter must be installed if possible in the panel near the three phase power supply of the mixer engine. This casing can be placed on a DIN rail for easy installation.

The Current Transformer (CT) shall be placed on the phase number 1. It must be located just after the switch.

CAUTION:

The input direction of the current in the ring of the CT is important. If it enters the wrong way the probe will not work. To avoid changing the installation after this, simply reverse the wires of the two terminals of the CT.



To prevent movement of the CT due to vibration, be sure to tighten the two screws on the power cable to fix it.

D.6.2. Electrical installation

After the mechanical installation is complete, you can connect the probes to their deported casing. It should not be powered during this operation.

CAUTION:

For the microwave probe, if the box is not yet fixed, disconnect all the connections prior to soldering as you may damage the probe.

H3 microwave probe

No wiring is to be carried out at the probe, just plug the M12 connector. This being fail-safed, you cannot make a mistake in the placement.

In the ITH3 deported casing, the connection of the probe on the connector is 2 points. The probe cable has got 4 wires; just plug the wire blue and black on their respective terminals as described in chapter 5.9. or on the label of the casing.

Then connect the "double twisted pair" cable by following the instructions in the same place as before. The CAN bus requires plugs at each end to work, make sure jumper J3 is in place, if the case is at one end (only one "double twisted pair" cable is connected to the box). If this is not the case, this jumper must be removed.

HWB power meter

CT requires 2 wires to be connected to the power meter. They need not to be shielded or twisted, but we recommend a minimum section of 1.0 mm ^{2}. These wires form a current loop. The meaning of this loop is important for the measurement. If it never changes when you power on the mixer, reverse this loop.

The three-phase must also be connected to the power meter. You must carefully respect the wiring of the different phases as if they are reversed, the measure will not work. The section of wires required to make this connection is 1.0 mm ^{2}.

Then connect the "double twisted pair" cable by following the instructions in chapter 5.12. The CAN bus requires plugs at each end to work, make sure jumper J1 is in place, if the case is at one end (only one "double twisted pair" cable is connected to the box). If this is not the case, this jumper must be removed.

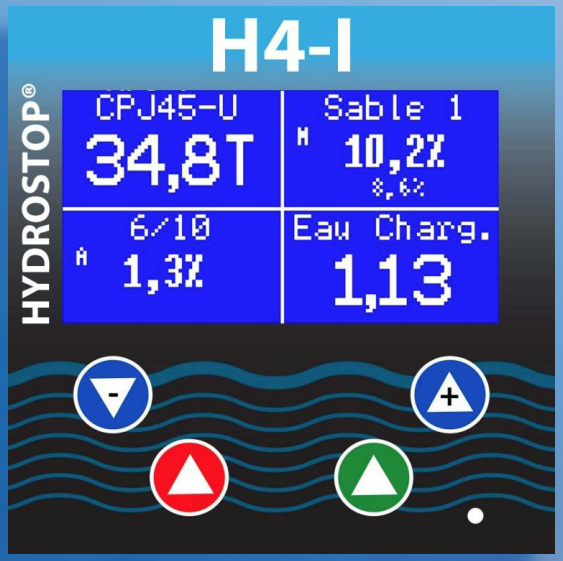
D.6.3. System checking

After completing the installation, you check the following points on H4-I:

- First, make sure the communication with the deported casings works. For this, the relevant box (s) must not indicate the corresponding failure to loss of communication with the deported casing (see Chapter 4.4.).
- Then check that the numerical value is not 0. The microwave sensor will always indicate a value greater than 0. The power meter will only display a value if the mixer is working. If the value is 0, check the wiring in the deported casing. For the power meter, check that the phases have been connected in the correct order because a reversal would prevent the proper functioning of the measure.

RAW MATERIALS
MANAGEMENT SYSTEM

H 4-I



HYDROSTOP®

Calibration manual

APPENDIX E

APPENDIX E - CALIBRATION MANUAL

E.1. Moisture probe calibration

The H4-I system can measure the moisture in sand and gravel.

As with all measurement systems, it requires rigorous calibration to ensure that the measurements are as accurate as possible.

In this section, we shall define the procedure to be followed for calibrating the system correctly.

Warning prior to calibration:

The calibration carried out will have a direct influence on the quality and future accuracy of the measurement. It is therefore crucial that you follow the instructions. Precise steps need to be taken to ensure correct calibration.

- The H4-I system allows 10 calibration points to be stored. However, in most cases 4 or 5 points will be sufficient.

The aim of the calibration operation is to provide the probe with reference points for a given measurement range. As a result, it is essential that the following points are located:

- 1 reference point representing a dry value (for example, an aggregate stored for a long time in a dry place away from moisture)
- 1 or 2 reference points representing the general values (for example if the aggregate has a general value that fluctuates around 6%, it is recommended to store 2 points within the area of this value).
- 1 reference point representing a wet value (for example an aggregate stored outside after a storm).

It is important to note that these points must, as an essential rule, reflect the real situation during production. Under no circumstances should the calibration be provoked by putting the probe in other place than the bin where the aggregate is stored. The geometry of the bins could significantly change the answer from the probe. **The measurement of the probe in a bucket with a given aggregate will not be the same as the measurement of the probe in a bin with the same aggregate.**

Similarly, provoking moisture in the aggregate will distort the measurement, bringing about an unnatural flow of water in the aggregate.

The value returned to the automaton and displayed on the screen is a calculation of the average between the points stored and the measurement carried out by the probe. It is for this reason that numerous points all around the same value should not be entered as this may disrupt the probe's reactivity.

Reminder of the pan drying methodology:

The aim of the pan drying is to confirm the value read by the probe through the manual measurement of the aggregate moisture. It should therefore adhere to an accurate methodology in order to ensure a reliable result.

What equipment is required?

The pan drying should be carried out using:

- 1 frying pan
- 1 gram accuracy scales
- 1 stove

How much aggregate should be used?

To carry out the pan drying correctly, **1 kg** of the aggregate will be sufficient. If the weight is below this, it could lead to an accuracy loss and a higher weight is not particularly convenient as it will lengthen the pan drying heating time. It is important to use a gram precision drying pan so that a measurement accuracy of 0.01% can be obtained.

What procedure should be adopted?

To carry out the pan drying effectively and to obtain the most accurate measurement possible, the following procedure should be adhered to:

- On the H4-I screen, note down the value read by the probe just before carrying out the pan drying.
- Take the aggregate out of the bin gate valve or from the extracting belt.
- Note down the "wet" weight of the aggregate weighed out using the scales.
- Place the aggregate into the drying pan and leave it to heat up until any moisture remaining is completely evaporated.
- Note down the "dry" weight of the aggregate using the scales.
- Perform the calculation: (Wet weight - dry weight)/Dry weight
- Enter the value obtained from the H4-I calibration menu (refer to section 2.3 – Moisture probe commissioning).

After the aggregate has been weighed out, it should be placed immediately in the drying pan. It should not be stored for a long period in any type of recipient before placing it into the drying pan. By doing so, condensation may form leading to moisture that does not come from the aggregate itself.

Take particular care not to allow the aggregate to heat up for too long to avoid transforming its properties.

APPENDIX E - CALIBRATION MANUAL

E.2. Silo weighing probe calibration

The H4-I system can measure the weight of cement silos.
As with all measurement systems, it requires rigorous calibration to ensure that the measurements are as accurate as possible.
In this section, we shall define the procedure to be followed for calibrating the system correctly.

Warning prior to calibration:

The calibration carried out will have a direct influence on the quality and future precision of the measurement. It is therefore crucial that you follow the instructions.
Precise steps need to be taken to ensure correct calibration.

- The H4-I system allows 10 calibration points to be stored. However, in most cases 2 or 3 points will be sufficient.

The aim of the calibration operation is to provide the probe with reference points for a given measurement range. As a result, it is essential that the following points are located: 1 reference point representingan empty silo.Indeed, for a specific reference, we need to be based on exact weight of the silo. For this, the only way is to empty the silo until the screw turns freely.

- 1 reference point after loading a truck.
- 1 optional third reference point if you fill the silo with two successive trucks without using the silo between.

It is important to note that these points must, as an essential rule, reflect the real situation during productionUnder no circumstances should the calibrationbe based on automaton value. In addition, the concept of "empty silo" takes into account the dead stock of the silo. You do not need to tap on the silo in order to completely empty it. Otherwise, the dead stocks will come back and your calibration will be wrong.
The value returned to the automaton and displayed on the screen is a calculation of the average between the points stored and the measurement carried out by the probe.

What procedure should be adopted?

To perform a proper calibration of the silo and make the most accurate measurement possible, the following procedure must be followed:

- Empty your silo until the screw turns in the air. Do not tap on it to empty it completely because the dead stocks will be created again and lead to a drift in measurement.
- Once the measurement stabilized, enter the point for a value of "0.0 T" (see Chapter 2.4 – Silo weight probe commissioning).
- Load a truck into the silo.
- Wait for the measure to stabilize at the end of the loading, before entering the second point. . The load can indeed cause an overpressure in the silo, which derives the measurement. Forecast about a quarter of an hour after the end of the load. Once the measurement has been stabilized, enter the second point with the weight value displayed by the weighbridge (see Chapter 2.4 – Silo weight probe commissioning). Don't use the value stated on the delivery because it can have a mistake of an hundred kg which will reduce measurement accuracy.
- If possible, make it again with a second truck to enter a third point before using the silo.

If you are unable to empty your bin, do not point to the value "0.0 T" but the theoretical value included in your silo before loading the first truck. Then enter the second point by adding to the theoretical value of the weight value indicated by the weighbridge.

CAUTION:
If you do not clear your silo, the accuracy of the calibration will be affected depending on the accuracy of your theoretical value. We advise you to empty your bin as soon as possible to achieve a full calibration.

E.3. Turbidity probe calibration

The H4-I system can measure the turbidity of loaded water.
As with all measurement systems, it requires rigorous calibration to ensure that the measurements are as accurate as possible.
In this section, we shall define the procedure to be followed for calibrating the system correctly.

Warning prior to calibration:

The calibration carried out will have a direct influence on the quality and future accuracy of the measurement. It is therefore crucial that you follow the instructions. Precise steps need to be taken to ensure correct calibration.

- The H4-I system allows 10 calibration points to be stored. However, in most cases 2 or 3 points will be sufficient.

The aim of the calibration operation is to provide the probe with reference points for a given measurement range. As a result, it is essential that the following points are located:

- A reference point representing a value for clear water. Indeed, for a specific reference it is necessary to have a point where turbidity is known and certain.
- 1 or 2 points of reference for the current values.
- 1 optional third reference point for extreme values of turbidity in your sewage tank.

It is important to note that, unlike the other measures, turbidity is not dependent of the environment. So you can make your first calibration point by plunging the probe into a bucket of clear water. Just make sure that the lens is not located too close to a wall as this will affect the measurement.
The value returned to the automaton and displayed on the screen is a calculation of the average between the points stored and the measurement carried out by the probe.

What procedure should be adopted?

To perform a proper calibration and make the most accurate measurement possible, the following procedure must be followed:

- Dip the probe into a bucket filled with clear water
- Once measure is stabilized, note down the value read by the probe displayed on the H4-I display.
- Enter your first calibration point with the two value you found (see Chapter 2.6 – Turbidity probe commissioning).
- Immerse the probe in your sewage tank
- Make a collection of water in the tank to measure its coefficient of turbidity
- Wait for the measure to be stabilized.
- Then, enter your second calibration point with this two new values (see Chapter 2.6 – Turbidity probe commissioning).
- If possible, make this again for another value of turbidity when turbidity has reached very high value.

APPENDIX E - CALIBRATION MANUAL

First Box			
Type		Name	
Equation		Analog output resolution	
Threshold 1		Threshold 2	

Second Box			
Type		Name	
Equation		Analog output resolution	
Threshold 1		Threshold 2	

Third Box			
Type		Name	
Equation		Analog output resolution	
Threshold 1		Threshold 2	

Fourth Box			
Type		Name	
Equation		Analog output resolution	
Threshold 1		Threshold 2	